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ABSTRACT

Presentations at the clinic focused on technical education programs under the Vocational Education Act of 1963 and the influence of the Vocational Education Amendments of 1968. The 12 presentations were grouped into three general subject areas. Four addresses discussed the emerging role of technical education, some suggestions for school-community communication, the institutional settings of technical education, and the impact of new legislation. A second group of speeches concerned the development of guidelines in areas emphasized in recent legislation: research, residential facilities, cooperative programs, and curriculum development. Summaries of discussion groups for these four areas are also included. Finally, four speeches describe the state of three new and emerging technologies: health technologies, law enforcement (police science), and aviation technology. The agenda and a list of conferees are appended. (CH)

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TECHNICAL EDUCATION FOR THE SEVENTIES

A Report of the

National Clinic on Technical Education Programs

Under the Vocational Education Act of 1963

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St. Louis, Missouri

March 26-28, 1969

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NATIONAL CLINIC
ON TECHNICAL EDUCATION

"TECHNICAL EDUCATION FOR THE SEVENTIES"

CHASE PARK PLAZA
ST. LOUIS, MISSOURI
March 26, 27, 28, 1969

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FOREWORD

This report contains the presentations and summaries of the discussions at the National Clinic on Technical Education held at St. Louis, Missouri, March 26-28, 1969. The theme of the Clinic was Technical Education For The Seventies. The topics and speakers that were selected to make presentations at this Clinic were chosen because of their particular expertise relating to technical education program implementation as it will be effected by the Vocational Education Amendments of 1968.

The sequence of topics in this report follow closely the items as they appeared in the Clinic program. Presentations on each topic were followed by discussion periods in which conferees had the opportunity to present and discuss problems and to exchange ideas. The specific topics of research, residential facilities, cooperative programs, and curriculum development as outlined in the Vocational Education Amendments of 1968 were discussed in depth and discussion summaries are included which were arrived at by the participants at the conference. The results of these were forwarded to the U. S. Office of Education immediately after the conference to insure consideration prior to the establishment of suggested procedures for the implementation of the Vocational Education Amendments of 1968.

In addition to serving as a record of the Clinic, this report should be useful to all persons concerned with planning, maintaining, and improving the quality of technical education programs under the Vocational Education Act of 1963.

Grateful acknowledgment is made to Professor Jerry S. Dobrovolsky, Head of the Department of General Engineering, University of Illinois, Urbana, Illinois, for his editorial contributions in collecting the data appearing in this report as well as having the report printed. Mrs. Betty Cutchin is also recognized for the preparation of the final manuscript for this report.

INTRODUCTION

The National Clinic on Technical Education is the sixth in a series held annually for state supervisors of technical education, deans of technical education, and industrial personnel. In addition, a series of regional conferences were held in 1959 and 1962 and a national conference in 1960. This was the first National Clinic that was co-sponsored between the American Technical Education Association and the Division of Vocational and Technical Education of the Bureau of Adult, Vocational, and Library Programs of the Office of Education, U. S. Department of Health, Education, and Welfare, Washington, D. C.

The Clinic was specifically designed to address itself to the problems facing technical education during the seventies. Particular emphasis was placed upon those portions of the Vocational Education Amendments of 1968 that pertain specifically to technical education.

The U. S. Office of Education sponsored nine national conferences in the spring of 1969 dealing with the elements of the new Act. The responsibility for each of these conferences was assigned to an individual contractor. The four areas that were deemed particularly relevant to technical education were research, residential facilities, cooperative education, and curriculum development. In each case either the director or his immediate representative of the particular national conference under his direction was a presenter at the National Clinic. Following the major presentations, the participants broke up into discussion groups. The summaries of the discussions were forwarded to the respective contract officers of the national conferences to insure their being considered in the drawing up of the documents of implementation for use by the U. S. Office of Education for the implementation of the new Act.

The Junior College District of St. Louis, St. Louis County, Missouri, has been a leader in the implementation of technical education at the junior college level. The diversity of opportunity for technicians to work in the St. Louis area in the aero-space related industries, chemical industries, and a host of others provided an outstanding opportunity for input by the Junior College District of St. Louis throughout the entire Clinic.

Approximately 270 Federal, state, and local personnel directly concerned with technical education programs participated. Representing 37 states and the District of Columbia, the conferees included members of the state boards of vocational education, state directors, state supervisors; college, student college, community college, technical institute, and high school administrators; teachers and teacher educators; and representatives from business, industries, Federal agencies, and professional associations.

EDUCATIONAL RENEWAL: THE ROLE OF TECHNICAL EDUCATION

Serious alienation from learning has become a common characteristic in education. During the past year we have seen serious boycotts, protests, riots and violence in the public schools throughout the nation.

The Lemberg Center for the Study of Violence reported that in the first four months of 1968, "44 percent of all recorded (civil) disorders involved schools . . . (and) there has been a three-fold increase over the entire year of 1967."

While at times these tensions are responsive to, or promoted by, factors in the local or national community, more often than not, the roots of such conflict are found in the school itself, in the curriculum, in the internal classroom operations, in the tasks our students are asked to complete.

This more recent social history of public schools has highlighted the fact that, as good as our public schools are, still not enough youngsters are being helped to overcome their divergence in environment, experience, and background and to use the differences in skills, motivations, concerns, and interests that grow out of life in different families in different parts of the country; we are more different in how we learn than alike.

The very highest priority in education today is a search for ways to renew our public schools and ways to plan such renewal.

The magnitude of the problem is staggering. Consider these figures: we have over 122,000 institutions of education in this country, from elementary schools through universities. We have close to 22,000 independent school districts. We have nearly 58 million students enrolled in educational institutions at any one time. These 58 million are served by close to 3 million teachers and 210,000 administrators. Our nation spends over \$50 billion a year for operating expenses and it has a current capital outlay of over \$8 billion.

The entire educational system is based on the notion of equal educational opportunity with the major effort given toward programs leading to college degrees, despite the fact that well over 40 million of the 58 million students will not graduate from college. At the same time, when alternatives to college preparatory programs or university degrees are offered, they are rejected and misunderstood by both the managers and consumers of American public education.

The community of educators is well aware of its failure, and, in this context, through federal aid, four efforts are underway to restructure and renew education.

- Expanding, at all levels, educational opportunity for the poor.
- Maximizing the effectiveness of education by tailoring it to the individual.

Presentation by Dr. Marvin J. Feldman, Program Officer, The Ford Foundation, New York, New York. The views expressed in this paper are those of the author and do not necessarily reflect the views of The Ford Foundation.

- Improving educational techniques, especially teaching procedures, through non-graded programs.
- Expanding programs in vocational education.

But these recent efforts in education have mainly failed. They have failed because they are at bottom peripherally; they have been placed in a crumbling model of education whose basic strategies are out-of-date, out-of-touch, and out-of-balance.

An education program today must have "zero reject" as its over-arching goal. No student should be allowed to fail or to put that another way, option must be made available as alternatives. Moreover schools must be held accountable by students, their parents, and society for the achievement of this goal.

It should also be clear that the school protests we have been witnessing are directed at more than changes in the organization of power. It is apparent that many sensitive educators have not been able to deliver the promise of recent federal legislation much less their own liberal values in the conduct of instruction. Despite administrative desire to promote individualized instruction, intellectual freedom, autonomy in course selection, the realization of student potential, the promotion of independent thinking, these values have not been sufficiently clarified because of the educators' misguided homage and pursuit of the "Mythical Goddess called Liberal Arts."

When we examine, then, the persistent problems which impede the education of a wide spectrum of our children and youth and relate the honest efforts of our school system to cope with them, it seems reasonable to offer alternatives in educational processes which might logically offer better solutions than those now taking place.

A relatively new comprehensive system might provide a better educational program for more students of diverse ability. This lively renewal of American education could emerge out of vocational education, broadly conceived. I am going to use the word vocational when at times I mean technical or industrial or occupational because I really don't care any more to play a semantics game.

Educators have been too afraid of the word "vocation." They send out students who have the required "courses" to their credit, but no vocational sense. Until now, our schools have been more interested in what happens to the student while he is still in the classroom. What happens to him after he leaves the classroom is regarded as completely his own concern.

The issue of accountability may well have its roots in this attitude.

What follows is offered only as a sample of an elementary-through-college educational program with a suggested community run "back-up" system.

Definitions of Comprehensive Education

But first, it would be well to clarify the various definitions of "comprehensive education." In some school systems comprehensive now describes any high school program that offers industrial arts, typewriting, and homemaking courses in addition to the usual academic subjects. Industrial arts and homemaking are certainly relevant to education, but they hardly make a school comprehensive.

Other schools, once academic, now call themselves comprehensive because they encourage pupils to seek a work experience. But work experience outside the school programs, often on the pupil's own time, unsupervised and unrelated to academic instruction, scarcely earns the right to be called comprehensive education.

Still others ship students by bus to spend half a day each school day in a shared workshop center for vocational activities. The bussing of pupils to a vocational educational center that functions independently of its feeder schools is undoubtedly a convenience for school administrators who are plagued by underachieving students and overcrowding, but it still does not furnish comprehensive education.

The most common of the so-called comprehensive schools is the multipurpose or tracked school. These schools house, under one roof, three sociologically and educationally discrete schools -- academic, vocational, and general. The multipurpose schools carry some students on the main track to college. The rest are shunted off either to the vocational track, where trades, not vocations, are taught, or to the general track, a watered-down version of education which prepares its students neither for a vocation nor the pursuit of higher education.

This track system tends to freeze students within the confines of their class, race, and social group. It denies to all groups the benefits of interaction and shared experiences.

At least half the college-bound students in the tracked schools are as ill-served as the students on the general track because they will begin--but not complete--their college studies. Not only do the schools fail to teach these youngsters skills or give them even the smallest technological understanding of society, but they also deny them the opportunity to rub elbows with the social class and life style with which they may well have to come to terms in the long run.

The tracked school also limits the vocational student's exposure to courses that might enrich his curriculum and his capacity to function well in his chosen vocation or to choose other options as they emerge.

(Actually, it is impossible to study vocational education without realizing there is really no system with a logical progression from school to school and from level to level. For sixty years, vocational education has been confused with practical training required for a job and has been regarded as separate and distinct from "education." It is associated with manual occupations and is thought of as inherently inconsistent with the ideal of higher education for all pupils. We give the students to vocational education when we have given up on them as students. We say that we want vocational education for students who do not have the ability for college rather than using the vocational processes themselves to help develop this ability.)

Secondary school students today must choose between "education for life" or vocational education. However, deep concerns arise when these general terms are translated into school curricula. What exactly do we mean by the term "education for life?" Is there such a thing as "life in general?" A vocation itself is a way of life. Therefore, can "education for life" ignore the concept of one's life work?

Purposes of Comprehensive Education

What we need, then, is a redefinition of the basic aims of education. Short of a full analysis of these aims, we can identify four related but distinct purposes which could be called the definition of "comprehensive education:"

1. To identify the talent and learning style of the individual.
2. To give him both physical and social knowledge of the world in which he lives.
3. To develop the skills the student needs to sustain and advance his life so that he may be a productive and creative individual in society.
4. To satisfy the individual's search for his own life values.

There are no separate goals in comprehensive education, but alternative means of reaching the same options. Comprehensive education insures the availability to all pupils of the same range of knowledge. Through different activities and in different classes, where teaching procedures are matched to learning style, all pupils move at their own pace and in their own way to the same destination. That destination is a multi-optional jumping-off point to new levels of education and to the work world.

People learn differently. Some do best with the spoken or written word as the main learning process; others by handling tools and materials, others by making charts and graphs along with other graphic arts media; still others through film making and drama. Any of these means, as well as others, might be used to teach any subject, depending upon the pupil's style. Once a pupil's style is identified--and this ought to be in the earliest years because it profoundly affects all future learning--then the style should become a central vehicle of his learning. (By contrast, most schools teach each subject in one style; hence they reach only those students whose style it happens to be. Result: students become branded failures when, in fact, it is the school that has failed.) If students are not motivated toward the acquisition of adequate education, we shall face an increasing waste of our human resources, continued riots in the streets, and a general deterioration of society. Except for the relatively small number of students who even now do seek learning for its own sake, students will be motivated to learn only if their schooling is relevant to their lives, to their ambitions, and to their styles of learning.

The Need for Relevancy

The essential question is not whether we should merge general and vocational education but rather how we can best exploit vocational education techniques in the interest of effective teaching. Culturally and economically deprived American students most likely would be the immediate beneficiaries of a comprehensive system since these students, above all others, have been largely untapped by contemporary educational techniques. But comprehensive education is of value to students whose primary interest may be the liberal arts.

When a youngster is provided with an opportunity to design, to fabricate, to test, and to report on an item, he goes through a number of behavioral changes not unlike the processes within the liberal arts. The vocational

processes surely could be used in this way as a great tool in liberating the mind for self-expression.

A basic fault in our present theory and practice of education is the idea that vocational education is a dull body of specific, technical facts and manipulative functions standing apart from humanistic studies.

But if we would be more precise in our definition of training as an instructional function, education as a learning process, and experience dictating the mixture of training and education, the liberating role of vocational education becomes clearer.

To say that vocational education must become the principal core of modern curriculum is to say only that the remainder of the curriculum must be more fully and more consciously related to the place of individual talent in human life.

Liberal education, as we conceive it, should be more than an education for intellectual pursuits and could embrace technical education. An educational program can and should furnish its students with the means to live fuller lives and to have fulfilling, productive careers.

Alfred North Whitehead said this so clearly: ". . . culture is activity of thought, and receptiveness to beauty and human feelings. Scraps of information have nothing to do with it. A merely well-informed man is the most useless bore on God's earth. What we should aim at producing is men who possess both culture and expert knowledge in some special direction. Their expert knowledge will give them the ground to start from, and their culture will lead them as deep as philosophy and as high as art."

Elementary Education

An effective comprehensive program would begin in elementary school. The development of the individual's personality, the identification of talent, and the acquisition of general knowledge begin here. The only aim of education at this level is to give the child that fundamental knowledge he will share with all members of society and to develop in him the intellectual and social habits necessary for his survival.

While elementary education is general in purpose, it is also very concrete. Children learn by experience--the specific, concrete experience of events, successes, accomplishments, failures, tasks, and joys. Since such experience is specific, elementary education, despite the generality of its purposes, is more specific in content than education at any other state. What is now questioned is this specific content and the way it is transmitted to children.

Underlying the entire program of comprehensive education is the concept that intelligence is not fixed. It can be developed by providing the child with enough interaction with his environment, interaction that is relevant to the role of early experience and psychological development. A great deal of learning is based on experience. We must, therefore, create the experience upon which to build the learning. Often we lose sight of the fact that doing is only the beginning. Thinking follows. Feeling follows. Doing is the

specific from which later generalizations will follow. And vocational education can contain a high proportion of doing if used properly for comprehensive education purposes.

The processes of vocational education require the student's active participation and will greatly enhance his motivation to learn. They will help to relate his education experience to any number of adult roles as well. Throughout the elementary grades, there would be a continuing examination of how man uses work for self-support, how major occupations employ knowledge, and how productivity is related to a variety of abilities. A major objective of elementary education would be to discover the talents of each child and demonstrate their relationship to the work world.

In an effective comprehensive program, youngsters would be introduced to the concept of choice between achievement through verbal or abstract performance and achievement through manipulation and demonstration of real objects. Both processes would be designed to arrive at the same learning goals. Each unit of work in the language arts, for example, would begin with a self-directed experience matched to individual readiness levels. Eventually all children would reach the same goal, verbalizing or otherwise demonstrating what they have learned -- responding in different ways in accordance with individual abilities and talents.

Success in elementary education is critical because it (a) enhances a child's self-esteem, and (b) lays the groundwork for later learning. The way to achieve the kind of education in which no child fails is to identify his style of learning and to deliberately enhance his talent.

The elementary school's role then, is diagnostic and prescriptive. It provides whatever experiences a child may need to "make learning real." It is pointless to read "Billy Builds a Boat" if the child has never built one or even seen one. It is even more pointless to change the name of Billy to Willie, color his skin black, and place the story in an urban environment, as some publishers are now beginning to do. In other words, when children are learning new skills, such as reading, the process does not need to be complicated by their also having to learn new information at the same time. Yet never having built or seen a boat is no barrier to learning. Either let the child first build a boat himself or have him read about things he is already familiar with. The school simply must take the social fact into account and prescribe accordingly. But the prescription cannot be filled without the resources of vocational education in the elementary school.

Few elementary schools teach science, math, languages, and technology in a systematic way based on a child's style of learning. Yet the elementary school is the place to teach these subjects--rather than in junior high where they are now taught. The reason? A young child learns such things better and faster than he will later when he is going through the most severe emotional and physical changes of his life.

The Middle Years

Vocational guidance would be introduced early in the middle-school years. Its aim would be to acquaint the student with the workings of industry and commerce to help match his talents with his career objectives. The vocational

guidance department would, for example, provide an annual career-objective analysis for each student, based on the diagnosis, discussions, predictions and evaluations of teachers, examinations, and computers. These analyses--really employment plans that are revised annually--would enable the student to appreciate the relevance of his school performance to his career possibilities.

The middle school is the school of early adolescence. Here is the time to teach music, art, literature, and the social skills. The whole purpose of the middle school should be to calm the anguish of early adolescence. But in addition, it should build on the child's style of learning and talents by helping him see what adults who share his qualities do in society--what jobs they have, what goals they pursue.

If ever there was a time for the student to be encouraged to look inward, to identify his talent, to take stock of his assets, to test himself for future decisions, it is in early adolescence. Art, music, literature, guidance, and the like belong in the middle school. And yet, paradoxically, it is during these years of emotional and physical change that the emphasis is on mathematics, foreign languages, and the physical sciences.

Most middle school youngsters will easily tell us all the subjects they dislike, all the activities they are poor in, but very few know what it is they do like to do or what their talents are.

The upper middle school years (junior high) is also the place for more intensive exploration of careers which is high in an adolescent's concern. ("Who am I going to be? What am I going to do?") The school must help each student try on roles through simulated experiences related to his school studies and his special talents and interests.

The High School

The idea behind comprehensive education is not simply to fit vocational education into the existing system but to make it the principal feature of a new system. The plan depends upon an extensive redesign of the secondary school curriculum.

The usual high school curriculum is a disaster, especially when it consists of tracks that lead either to college or office work or manual trades. There are few things more evil than the structure of secondary education in terms of its negative impact on children. Tracking closes off alternatives at the moment youngsters need to try them out.

High school is also a time for integration of subject matter. Relevant education means, in part, subject matter related to subject matter. With the explosion of knowledge and the growth of subject matter specificity it seems reasonable to ask that science, math, English, social studies, and the laboratory become relevant, one discipline to the other.

One model that seems logical at the secondary level is the use of multiple houses which are organized around learning style laboratories. A house master would supervise the interdisciplinary teaching team. In this way the separate

disciplines of mathematics, language, physical and social sciences are drawn together. Each lesson in any one discipline would reinforce the others.

A balanced secondary school would have three major departments: theory for abstract knowledge; laboratories for self validation of the theoretical portion of the curriculum; and an applications department. At the present time, academic schools rely only on the first two inputs--theory and laboratory; the skills portion of the school curriculum is found in a separate system of vocational education. And yet another valid role for vocational education would be the applications learning laboratory.

The learning laboratory would be used for students to demonstrate their understanding in behavioral ways. The learning laboratories would be both inside and outside the school itself. The labs would be closely tied to real occupational functions.

But there is a much more important issue which must first be faced. If we truly believe the school has a responsibility to identify, develop, and release talent, if we are ready to recognize the marvelous uniqueness and value of every individual, then we must have the wisdom to realize we can do justice to our students only when our educational framework is truly integrated into other social formats: industry, business, civil and military services, the greater community.

Going beyond the formal school is necessary if we are to identify a student's experiential base, to isolate what he can learn from what he needs to learn, and to help him learn on the basis of valid identification procedures what he needs to know before he can proceed to other levels of education and training.

What has become essential is a self-improving educational system in which each student in a large heterogeneous population may receive the individualized instruction which would permit him to proceed along an educational path which, as far as he is concerned, is optimal.

Under such a system, no student would be rejected outright at any stage of his education--although he might be directed, at least temporarily, to more modest objectives when there is reason to believe his career choice offers little probability of success. In such a system, all students would be considered candidates for post-secondary education and training. And all would have several options available when they graduate from high school.

They would be prepared to work at simple trades and occupations, to go to a two-year community college or technical school, or to move right into a four-year college. Even the choice of a two-year college or technical school would not cut off other options. Upon graduation, the student would be prepared to work at a technical level or to transfer to a four-year college to develop further his skills and to enrich his liberal education.

A New Institution of Higher Learning

The new institution of higher education is necessary for a model comprehensive system. It would be an alternative to the kinds of universities that exist today--colleges that examine knowledge objectively and dispassionately,

that research and advance the storehouse of facts, that hold tradition dear, that specialize in some small but significant part of disciplines, that are isolated from applied relevance, that serve the relatively few who have the style and talent for research and publishing. The new institution would be for urban America today what the land grant colleges were for the late nineteenth century's need for professional competence in agricultural economy.

The mission of a new comprehensive institution of higher learning is becoming clearer in a society facing interracial and intergenerational conflict. Vast numbers of our college-age youth are rejecting the nation's historical value system because our education system in the main has not identified the diverse talents of our students and demonstrated where such talents are used and needed in our pursuits in the work world. Simply stated, our students reject our value system because they do not know what it is they can contribute to the system, what it is they can do well, and where in the system they belong.

One reason for this new kind of higher education is the need for more trained persons. The overwhelming majority of today's institutions of higher education give preference to those possessing intellectual (say verbal) aptitude. This new institute would not discriminate against other types of aptitudes--manipulative, social, athletic, esthetic, mechanical, graphic, artistic, perceptive, etc.

The institution would be open to qualified students--"Qualified" denoting merely maturity, earnestness of purpose, and a capacity to profit from the institution's program of instruction. It would be dedicated to the principle that no student need be rejected from an educational program.

Higher education must not always be for the few. One cannot speak of the "appalling waste of human resources" and at the same time, deprive of a college education a young person who may have sensory discrimination or the emotional sensitivity needed for esthetic responses or human interactions, -- very much valued in vocational education. The new institution of higher education, especially in urban centers, would not choose to give the student two initial years of general education and then send him on for two more years of specialization.

Such a procedure would not fit the institution's educational philosophy--vocations cannot be separated from culture. Cultural studies are intended to serve not only a leisure time purpose but also to have a profound effect on the life activities, beliefs, and behavior of our new graduates.

The education offered at the institution--called general education rather than liberal education (liberal education is that education which develops social concern)--is an attempt to help the student establish some degree of unity and organization for his vocation out of the tremendous variety of knowledge, including the random social and political chaos, confronting him daily. One of its aims, then, would be to develop in the student the capacity to select the truly important issues among the many he will encounter.

Through general education, the faculty would attempt to provide every student with a framework of knowledge into which his special interests and competencies, both intellectual and professional, could be fitted. The faculty

would try to make every student aware of the culture of which he is a part, to give him an understanding of how that culture evolved, and to help him participate effectively in it.

The institution would be sensitive to the explosion of knowledge and to the speed with which "facts" learned in school lose their usefulness in a rapidly changing technological society. Facts, like fish, cannot be stored indefinitely. One must learn to catch fish as they are needed. Thus, the institution would be dedicated to a policy of teaching students how to study independently to acquire the habit that would be useful to them throughout their lives.

General education deals fundamentally with intellectual competence and attempts to develop skill in critical thinking. Since the high school would have already given the students some general education, the faculty would seek to achieve sophistication by building upon that base. During the last two years of high school, students would spend part of each summer at the institution to receive an overview of its programs so they can begin selecting vocational options. The faculties of both the institution and the high school would review the curricula and the progress of students. Course content would be changed periodically to match student performance. A single department of guidance would serve both the institution and its feeder schools.

The institution's courses in the humanities would include literature, languages, philosophy, and the fine arts. Since leisure time looms in the future of all the people in this country, these courses would be considered the liberalizing elements for leisure-time activities. Moreover, when a liberally educated man is at peace with himself and secure in the knowledge of his own talent, then he is able to respect the belief systems of groups other than his own.

The social studies portion of the curriculum--courses in history, economics, political science, psychology, and sociology--would not be a part of the liberal education but a part of the general education necessary for vocational development. Natural science would include courses in mathematics, physics, and chemistry, which would be integrated with the student's vocational goal.

The main function of the school would be to prepare students for their careers since the overwhelming majority of high school graduates attend institutions of higher education to pursue a vocation.

However, research indicates that students in liberal arts colleges are unable to give an adequate description of the occupational activities to which they aspire. When they do comment on vocations, such as physician, lawyer, or engineer, they are more likely to emphasize the way in which these professionals live, rather than the character of their work. Their interest in the occupations is related to the styles of life and earning power of the job. Typically, students view all vocations as means by which desired social goals can be attained. A student's vocational aspirations play an important role in his future life. A man's vocation assures his position in the status system of today's mobile society. Youth of high-status families have several roads to success, but those of low-status families--who constitute a sizeable proportion of our metropolitan youth--find occupational placement the best road to increased social status.

By concentrating on the training of technical and professional support personnel, rather than the professions themselves, and basing this preparation on a broad liberal and general education, the new institution should be able to produce broadly-educated rather than narrowly-trained specialists to meet both the needs of social status and technical competency.

The Systems Approach

These goals for education could certainly be attained now by utilizing the systems approach in the new institution of higher education, particularly in the inner city.

Systems engineering analyses offer a new orientation for approaching the many complex problems of education. It requires a thorough analysis of the curriculum and educational structure and precise stipulation of objectives, resources, alternatives and criteria. It requires the integration and application of teaching teams and related technical personnel. Since the aim is greater productivity without sacrificing standards of quality, it involves the use of technical laboratories and shops with optional and alternative assignments, experiments, and design assignments, and computers for rapid data acquisition and analysis. The system would be self-improving, based on constant feedback information at all stages.

The computer would not teach. The system would serve to acquire data and rapidly analyze the student's progress and rate of progress, difficulties, and patterns of difficulties. In conventional classroom situations, patterns of difficulties may not be apparent for weeks or months. By the time the difficulties are uncovered, it may be too late to effect adequate remedial measures. The loss of student time is irrecoverable. By utilizing computer diagnoses (not computer teaching), difficulties may be reviewed within the course of a single period or, at most, a few periods. Rapid, effective remedial measures should be undertaken at once. On the other hand, as patterns of accomplishment are revealed, accelerated measures for advancement may be instituted.

By effectively relieving the teacher of the burden of grading and analyzing each student's performance and through its capacity for rapid data acquisition and analyses, the computer, in conjunction with some auto-instructional devices, for optional assignments, makes possible, on a mass basis, the dream of a system which permits each student to learn at his optimum rate.

Although we already refer to something we call an educational system, the word system is truly misused. Based on its engineering definition, the word system requires a measurable input (the student), a power source (the school), a change in input (the curriculum), and a measured output (the graduate). Without a vocational base for precise measurable behavioral goals, the output of an educational system is measured in the vague, fuzzy terms of society, citizenship, or general education.

The Back-Up System

In most good engineering designs, redundant systems are commonplace. A breakdown in a component of a missile or weapon, for example, engages a back-up unit to continue the mission. Therefore, we cannot fail a space vehicle. But in education, we can fail students. Education as a system needs such a back-up design.

In the new educational system, the back-up would be a new type of classroom located in a typical community-run center. The center would be able to grant high school and advanced degrees. Any number of students of various ages, interests, and accomplishments--for whom the regular educational design has not worked--would attend the classroom. Each would be engaged in different studies ranging from remedial programs to advanced work to vocational training. The students would share the same classroom only because of its special facilities and services and because they find it pleasant and encouraging to be among other people who are also learning. An educational "hostess"--a member of the community who helps students understand the facilities, schedules their assignments, distributes materials, and has telephone and visual communication links with a specially-staffed academic center at the new urban institute--would staff the special classroom.

The community classroom would be fully equipped with the latest communications equipment. At each study carrel would be cartridge-loading tape machines (visual and sound), closed circuit television, the appropriate study syllabus, programmed and regular textbooks, and materials for study and supplementary reading.

The academic center at the urban institute would provide the direction for students in their self-paced studies at the community classroom. This affiliation would thus insure the value of the degrees and diplomas.

Each teacher would be responsible for three or four courses in his field and for supervising every student taking one of his courses. Because the courses would be self paced with computer-directed remedial assignments, the teacher could supervise several times the number of students ordinarily supervised by one teacher.

This "back-up" program would not only serve youngsters enrolled in the main system but also make a variety of goals attainable to many people on their own time in their own neighborhoods, without requiring them to drop whatever they may be engaged in and go off to distant schools. As the program has been described, only the broad outlines of part of a comprehensive educational system have been sketched in.

Filling in the outlines are a large number of techniques including such ideas as older and more talented students teaching younger ones and those with special problems; students participating in decisions about teaching materials and learning experiences; teachers given time for retraining on the job; and, most importantly, the understanding that--while the emphasis here has been on the more pragmatic skills as a way of connecting young people to learning--social concern is a quality each pupil should acquire. This would include sensitivity to others, awareness of conflict and ways of resolving it, an understanding of human variety, the satisfactions of service to others, and the mutual respect of majority and minority belief systems.

The need for a broad vocational base as a way to renew education has been stressed because we have been nourishing our young with intellectual ideas independent from relevant experience. This generation of young American students is the most intellectually gifted we have ever had. It is now a question of applying such intellect or deluding our young into thinking themselves capable of dealing with problems independently of experience.

Vocational education can become the means of directing the student away from the abstractions of symbols and sterile cleverness toward his own life style. It can deliberately simulate in the classrooms situations from life necessary to develop social concern and proper behavior.

Grants in Vocational Education

A number of programs that illustrate some aspect of the kind of comprehensive education described in this paper are being conducted under grants from the Ford Foundation.

A type of "back-up" system, similar to the one described, is being tried at the New York Institute of Technology for students who do not appear likely to succeed in the conventional training programs for technical and sub-professional careers. A computer uses test data to prepare a comprehensive profile of the student's ability, skills, and knowledge. The institute uses these profiles to develop individually prescribed programs for each student. Some go to two- or four-year colleges; some take regular and remedial work; and others combine a job with off-campus studies.

In the Nova Schools in Broward County, Florida, a technical science program is being developed for grades one through twelve. Technical science, as it is conceived of in the Nova Schools, is a new discipline--not separate vocational training--based on technology. It is designed to impart both a theoretical understanding of basic scientific principles and manual skills.

Stout State University received funds to test, in ten cooperating Wisconsin high schools, a new industrial-arts course which presents manual and machine skills in a context of basic industrial concepts rather than as unrelated exercises. The program seeks to offer the basis for a lifetime of learning and advancement rather than narrowly task-oriented knowledge. It also includes general education elements for an understanding of economics, marketing, distribution, personnel, and related facets of industry.

In New Jersey, selected elementary school classes, from kindergarten through the sixth grade, are testing the use of vocational techniques both as an alternative approach to conventional academic subject matter and as a means of introducing children early to the concepts and processes of a technical society.

Mississippi State University has received Foundation funds to aid pilot high schools in Mississippi in using team planning to coordinate academic and vocational offerings. The teams will consist of English, mathematics, science, guidance, and vocational teachers.

The Foundation helped New York City schools merge two vocational programs for marginal students into one course offering preparation for business, health, and industrial careers. The course uses the team-teaching approach in which academic subjects are correlated with pre-occupational courses.

Cogswell Polytechnical College in San Francisco was assisted in expanding a comprehensive curriculum program to ten Bay area high schools. Western Washington State College is developing a comprehensive curriculum in the

graphic arts and the Newton, Massachusetts, high schools have been converted to fully comprehensive schools, offering vocational and technical courses to all students as electives.

The Educational Development Center has received a Foundation grant to develop instructional materials for a curriculum that joins vocational and academic education.

Two projects, the Program for Action by Citizens in Education (PACE) in Cleveland and the Center for Research on Utilization of Scientific knowledge (CRUSK) at the University of Michigan, attempt to develop human concern and constructive behavior particularly in areas of racial or intergenerational conflict. The PACE project is an attempt to bring attitude development into the classroom through a course concerning such topics as "The Tolerant Individual," "Prejudice, Religion, and Poverty," and "The Negro." The CRUSK project is experimenting in a number of schools in Michigan and elsewhere with new ways of responding to school crises. The experiments include internal problem-solving teams, parallel consultations with established school leadership and the agitators, student-faculty ombudsmen, and a social studies curriculum unit on interracial and intergenerational conflict.

COMMUNICATING WITH ADVISORY, CIVIC, EMPLOYER GROUPS OR OTHER PERSONS ABOUT TECHNICIANS

The use of consultants and advisory committees from outside of professional education, and especially those representing employers, has always been important to the success and growth of technical education programs. Communication with them and with civic and political leaders, parental groups, and the public at large about technicians is becoming more and more important.

New and special provisions of the Vocational Education Amendments of 1968 mandate advisory committees and involvement of additional persons many of whom will not be familiar with the traditional professional language of technical education. Broadened research efforts, exemplary programs, curriculum development, cooperative education programs, special residential schools, work-study programs, programs for persons with special needs and for the handicapped, provisions for preparing and up-dating teachers and other personnel, and even the consumer and homemaking provisions of the Act have implications at the technical level and involve communication between technical educators and their advisors and others.

Who are these advisors? The following includes several of the most important, most of whom don't talk the educator's language:

1. Program and curriculum advisory committees, with major representation from employers.
2. Board members and/or trustees of educational institutions involved in technician education.
3. Local, county, or state political personnel.
4. Labor leaders.
5. Civic leaders.
6. Groups of parents.

When planning to communicate - either verbally or in writing - several important characteristics of these persons which affect the communication process should be considered:

1. They are busy, hence their time is valuable and limited, and they are impatient with long-winded communications.
2. They are interested in the subject.
3. They have been selected or are being communicated with because they have knowledge to give and contributions to make.

Presentation by Dr. Walter J. Brooking, Program Officer, Technical Education, U. S. Office of Education.

4. They feel a taxpayer's, a "civic" or "public minded," or a parent's interest in the community's educational programs. Employers have the added motivation of desiring an educational program which will provide beginning employees with preparation which is relevant to the employer's needs.
5. They do not understand the jargon and technical terminology of professional technical educators, and usually do not want to spend much time learning it. They feel that language must and can be simple.
6. They are "practical" persons rather than theoretical. They want to assess problems or situations, evaluate them, decide on a course of action, and get on with the solution.
7. They need quickly to find a common ground of concept and language to begin to communicate within a mutually understandable frame of reference if they are to become or remain challenged and effective contributors.
8. Almost all of them have a deep respect for what they consider the educator's prerogatives, and they often hesitate to express their real ideas, suggestions, and criticisms for fear of encroaching on the educator's responsibilities or of seeming uninformed or presumptuous about educational programs or problems.

PLANNING COMMUNICATIONS FOR SUCCESS

The first step in communicating with anyone about technicians or programs to educate them is quickly to establish a common understanding of what is meant by "technician." It is important that this definition be simple for quick comprehension and devoid of abstract or long explanations.

The outline of a curriculum, such as shown here for one kind of technician, can be presented at the beginning of a discussion to quickly establish a frame of reference.

Experience has shown that the use of a curriculum outline to define technicians at the outset of written or verbal communication can make the difference between a valid and valuable study of discussion and one almost worthless because of lack of common definition.

If, for example, an employer is asked, how many technicians of a particular kind he now has or could use in the future, his answer will have meaning to the questioner only if both have the same frame of reference. If the questioner presents a curriculum outline as a frame of reference to the employer, he will immediately begin to think in terms of two-year, post high school, associate-degree, specialized workers of particular qualifications. Both can then attack the heart of the objective of the inquiry without being distracted by lengthy, futile, and imprecise definitions.

USE OF CURRICULUM GUIDES TO COMMUNICATE

A curriculum outline can also provide the quick frame of reference needed by an advisory committee to plan a new program to educate technicians or to

WATER AND WASTEWATER TECHNICIAN

Curriculum Outline

	(Hours Per Week)			
	Class	Laboratory	Outside Study	Total
<u>First Semester</u>				
Introduction to Water and Wastewater Technology and Related Fields -----	3	3	6	12
Mathematics I (Technical) -----	5	0	10	15
Physics I (Heat and Mechanics) -----	3	3	6	12
General Drafting -----	0	8	0	8
Communication Skills -----	<u>3</u>	<u>0</u>	<u>6</u>	<u>9</u>
	14	14	28	56
<u>Second Semester</u>				
Mathematics II (Technical) -----	4	0	8	12
Technical Reporting -----	2	0	4	6
Basic Hydraulics for Water and Wastewater -----	3	4	6	13
Microbiology for Water and Wastewater -----	2	6	4	12
Physics II (Electricity and Light) -----	<u>3</u>	<u>4</u>	<u>6</u>	<u>13</u>
	14	14	28	56
<u>Third Semester</u>				
Sanitary Chemistry and Microbiology I -----	2	6	4	12
Water Supply and Wastewater Control -----	2	4	4	10
Water Purification -----	3	3	6	12
Surveying -----	2	6	4	12
General and Industrial Economics -----	<u>3</u>	<u>0</u>	<u>6</u>	<u>9</u>
	12	19	24	55
<u>Fourth Semester</u>				
Sanitary Chemistry and Microbiology II -----	2	6	4	12
Wastewater Treatment -----	2	4	4	10
Instrumentation and Controls -----	3	2	6	11
Contracts, Specifications, Codes, and Estimates and Costs -----	3	4	6	11
Industrial Organizations, Institutions, and Government -----	<u>3</u>	<u>0</u>	<u>6</u>	<u>9</u>
	13	16	26	55

improve an existing one. The curriculum outline in each of the following curriculum guides can serve its purpose in its own peculiar field as a means of communication:

- *Electrical Technology - A Suggested 2-Year Post High School Curriculum - OE-80006. 75¢
- *Electronic Technology (Revised) - A Suggested 2-Year Post High School Curriculum - OE-80009A. \$1
- *Mechanical Technology - Design and Production - A Suggested 2-Year Post High School Curriculum - OE-80019. 70¢
- *Chemical Technology - A Suggested 2-Year Post High School Curriculum - OE-80031. 75¢
- *Instrumentation Technology - A Suggested 2-Year Post High School Curriculum - OE-80033. 75¢
- *Civil Technology - Highway and Structural Options - A Suggested 2-Year Post High School Curriculum - OE-80041. 60¢
- *Forest Technology - A Suggested 2-Year Post High School Curriculum - OE-80054. \$1.25
- *Water and Wastewater Technology - A Suggested 2-Year Post High School Curriculum - OE-80057. \$1.50
- *Metallurgical Technology - A Suggested 2-Year Post High School Curriculum - OE-81012. \$1.25
- *Grain, Feed, Seed, and Farm Supply Technology - A Suggested 2-Year Post High School Curriculum - OE-81014. \$1.50
- *Food Processing Technology - A Suggested 2-Year Post High School Curriculum - OE-82016. 50¢
- +Scientific Data Processing Technology - A Suggested 2-Year Post High School Curriculum
- +Architectural and Building Technology - A Suggested 2-Year Post High School Curriculum
- +Ornamental Horticulture - A Suggested 2-Year Post High School Curriculum
- +Farm Crop Production Technology - A Suggested 2-Year Post High School Curriculum
- +Agricultural Equipment Technology - A Suggested 2-Year Post High School Curriculum

* May be purchased from: Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402

+ Being Prepared

Each of these guides is a plan based on operating exemplary programs. Administrators and their advisors can easily adapt this plan to their particular local needs. Although their programs will differ from the one in the guide, it will have been the starting point for fruitful communication.

WHY START WITH A GUIDE?

The discussion of a plan for a technician education program may be compared with the discussion of a plan for constructing a building. The quickest way to communicate with a contractor is to show him a plan and specifications of the type of house you want. He can then adapt this plan to the building materials available in Maine, Florida, New Mexico, or wherever your lot happens to be.

The plans and specifications are presented to the contractor at the very beginning of the conversation so that he may understand generally what is involved and work from that general idea to the specifics. This same principle should be followed in the use of curriculum guides.

The curriculum guides listed are addressed to school administrators and others not expert in the particular technology. They provide the salient information, with illustrations, and in the first 10 to 15 pages an almost popularly written disclosure of the important items administrators or advisors need to know before they begin to discuss the details of a new program. Most of all, the curriculum outline in each guide provides a quick conceptual definition which provides a delimiting framework for the rest of the discussion.

GUIDES REMOVE "STATUS" OBSTACLES IN COMMUNICATION

A second important psychological factor in the use of guides of this kind is that they provide a platform from which an advisor or person who is not an expert in the field can raise a question or start a conversation by referring to something in the guide. This permits him to discuss matters which he might be reluctant to discuss for fear of appearing uninformed or for fear of encroaching on prerogatives considered those of the educator or someone else. Thus, the guides provide not only a quick definition but a psychological starting place and stimulus which encourage participation and contributions by non-educator advisors.

Two recent publications from the U. S. Office of Education are of special significance in their potential for involving employers, the public at large, parents, and others who need to become involved in technician programs or important matters relating to them. *Criteria for Technician Education -- A Suggested Guide has proven unusually effective in the hands of advisory committees, trustees, school boards, parents, the public at large, and even faculties outside of technician education programs as a communication starter and as a conveyer of the basic concepts about technician education. The demand

* May be purchased from: Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402

for it on the part of advisory committeemen and administrators who need to involve the public as emphasized in the 1968 amendments of the Vocational Education Act has already required a reprinting even though it was first published only three months ago.

The other publication of particular importance is addressed to student development programs and entitled *Pretechnical Post High School Programs--A Suggested Guide." This book offers a plan for technical institutions to qualify their underprepared students to begin a technician curriculum. In light of the emphasis of the 1968 Act on persons with academic handicaps and on the involvement of parents and others, this publication is of special importance.

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TECHNICAL EDUCATION IN THE JUNIOR COLLEGE

The junior college movement is not young; maybe it's old enough not to be any longer considered a "movement;" maybe it's now a recognized part of American education. There are several strands in the fabric: the private junior college--predominantly liberal arts in orientation--tending to transfer its graduates to baccalaureate programs in four-year institutions; the technical institute--either public or private, with rather specific occupational goals--tending to place its graduates in technical jobs; and the public community-junior college, usually called simply the community college. I shall confine my remarks primarily to it.

The community college is typically an urban institution. It is frequently large and may have several campuses. Important examples include the excellent college here in St. Louis and others in Miami, Chicago, New York, Seattle, and Philadelphia. Community colleges are the fastest growing segment of the two-year college fraternity. The 1968 Junior College Directory lists 648 public institutions out of a total of 912; more significantly, they enroll 1,530,000 students out of a total of 1,670,000. For the past five years, an average of more than 50 new two-year colleges have been established annually; almost all are public.

The community college characteristically offers a comprehensive array of programs including transfer, occupational, general education, remedial, adult and continuing education, community services, and counseling and guidance. It is typically an "open-door" admission institution, admitting all who apply but being selective in those whom it retains and graduates. It is free or low-cost, oriented toward the community that it serves, and involves that community in its programs and determinations of policy. It is responsive and unfettered. It is an "opportunity college."

Ed Gleazer, my boss, the Executive Director of the American Association of Junior Colleges, who "tells it the way it is," says

"A good community college

- is a community college
- has an identity of its own
- is part of total education
- has a realistic program
- is characterized by superior teaching
- has an adequate financial base
- is effectively organized
- motivates
- plant is accessible and recognizable."

This institution is an American social invention. It is an instrument of tremendous potential. It can motivate youth who have had little hope for learning beyond the high school. It can lift the sights and strengthen the efforts

Presentation by Dr. Lewis R. Fibel, Specialist in Occupational Education,
American Association of Junior Colleges.

of the generation wanting to go beyond their fathers' achievements. It can stimulate the creativity and slumbering interests of adults. It can provide the means for training that lead to a higher level of employment. It can train for the new skills demanded by a changing technology. It can serve as a focal point for community identification. Oriented to the community, controlled by the community, it can be the catalyst for the processes by which the values of a free world's culture can be refined and advanced.

The coming-of-age of the community college is indicated not only by the growth pattern that I have given you but also by the large number of endorsements of the concept that so frequently appear in federal and state literature as well as from other sources. The most substantial recent endorsement is in the form of the comprehensive community college bill introduced into the Congress by Senator Harrison Williams of New Jersey. This calls for federal expenditures in excess of \$6 billion for support of community colleges over a three-year period.

We are also flattered by the imitative sounds that we hear on the international scene: Japan, Ceylon, Peru, Indonesia, and many other countries are considering the adoption and adaptation of the community college.

The occupational education portions of community college programs are themselves widespread. The seventh edition of American Junior Colleges, published by the American Council on Education, lists over 100 major categories of occupational programs that are offered in two-year colleges. Our Occupational Education Bulletin each month adds new ones to the list. To suggest the breadth of program, let me list for you, in each of several categories, both some older and well-established curricula and some new and emergent ones.

In health fields, associate degree nursing programs are well accepted. Dental hygiene, x-ray technology, and medical laboratory technology have good foundations. Recently, however, there have been added a plethora of new programs, in most cases for new occupations in inhalation therapy, surgery technician, ward manager, medical emergency technician, and others.

In business fields, secretarial, accounting, and marketing curricula have been successful at junior colleges for many years. Business data processing is the new glamorous entrant in this field. There have also been recent additions such as supermarket management and hospitality fields, as well as specialized programs in insurance, banking, and real estate.

The public service or public administration fields are, as a whole, quite new. The frequency of occurrence of police science programs, however, makes them no real novelty. Rarer and more unusual are programs in corrections, traffic safety, recreation, and urban planning.

In my particular area of responsibility, engineering- and science-related fields, the workhorses remain the technologies related, respectively, to electrical, mechanical, and civil engineering, but there are important developments in the creation of curricula for the preparation of laboratory technicians in chemical, biological, and physical sciences; in industrial complexes such as the aviation, automotive, and air-conditioning industries, as well as interdisciplinary curricula, most particularly electromechanical technology.

In all the above, I have implied that the main thrust has been the preparation of middle-level manpower, especially technicians, by means of two-year programs, usually leading to the associate degree.

This is true and may well continue to be the main focus of occupational education in the community college. However, mention should be made of increasing activities of other than associate degree-types. Many community colleges are offering six-month or one-year certificate programs in a variety of occupations, are becoming more and more involved in apprentice training, and are establishing a variety of short courses for training or retraining. Nor are these efforts confined to the technician-level of manpower. Programs are also being offered for the skilled trades and sometimes for semiskilled jobs. Of great potential and interest are the efforts of community colleges to alleviate the problems of disadvantaged groups with special programs designed for them.

At the same time, it should be forcefully stated that other kinds of institutions are making important contributions in this area. Significant numbers of technicians are being trained in vocational and comprehensive high schools, in area vocational schools and centers, in proprietary and private schools including by correspondence, in four-year colleges and universities, by MDTA and OEO programs, in the armed forces, and through the efforts of private industry. The community college has no privilege of monopoly in technician training. Unless it can do a job better and cheaper than another type of institution, it may not successfully survive in the field.

The quality and quantity of occupational education in the two-year colleges of this country have not always been the greatest. The Board of Directors of the American Association of Junior Colleges, being convinced of the desirability of improving this effort and of the importance of the Association to assume a leadership role in this effort, persuaded the W. K. Kellogg Foundation of Battle Creek, Michigan, to make a grant to the Association to establish the Occupational Education Project. The project has as its objective the stimulation of the growth of occupational education in the nation's two-year colleges. The project was to make maximum use of existing operations, both within the Association and outside of it, and to cooperate and coordinate with other activities. The project used the term "occupational education" as a descriptive, in preference to "vocational education" or "technical education" or the hyphenated hybrid, to suggest the widest possible scope of its activities.

To staff the project, the Association invited a number of prominent educators to join its staff. To direct activities in health-related fields, Ken Skaggs of St. Petersburg Junior College in Florida came to the office. In business fields, Doug Burris of American River College in Sacramento, California, joined the team and, when he went back to his sunny homeland, his place was taken by Gil Saunders, another Californian from Orange Coast College near Los Angeles. After a variety of educational experiences in the states of New York and Michigan, I became a member of the staff as specialist in industrial-based curricula. After its first year of operation, the prognosis for the project was deemed interesting enough to the Foundation for it to broaden its support. We added to our group Jim Stinchcomb who, coming to us after service with the International Chiefs of Police, assumed responsibility for

an increased effort in the field of public administration and service. The professional staff has been fortunate in the support of a loyal and competent back-up crew.

The staff quickly decided that one of its most important activities would be to make significant information easily available to technical educators at the colleges. One of the ways we chose to do this was through the publication and distribution of the Occupational Education Bulletin. This is published regularly once a month and, in addition, each quarter a special feature issue is distributed. The Bulletin attempts to provide news concerning new programs, publications, and developments that might have value to the operators on the firing line. We earnestly request your cooperation in sending us news about your institution. Others are always interested in learning about it. We now have a mailing list of about 9000 for the Bulletin and we will try to add to that list, without cost, anyone who writes to us in Washington requesting it.

The other formal activities of the project can be divided into four-year programs: the preparation of curriculum guides, the preparation of service area publications, the identification of consultants, and the holding of regional conferences.

We accepted from the onset of the project the fact that many fine curricular guides had been prepared by other organizations, particularly the series from the U. S. Office of Education. However, there were some fields where either there were no existing guides or else the existing ones were not adequate or appropriate for two-year colleges. We attempted to plug these holes. Our general procedure is to hire an expert in the field to write the guide and to give him the backing of a diverse advisory group against which he can test his ideas. Successful publications in this program include those in the law enforcement field, in traffic safety, in supermarket management, and for the hospitality field. Our publications list--available without charge from the Association--carries a list of these currently in print, and each new publication is announced in the Bulletin and in the Junior College Journal.

One of the serious gaps we saw in the information available to junior colleges was serious and pertinent discussion of some of the issues and techniques in occupational education that cut across curricular lines. We termed our output in this program service area publications. Again, general procedure is to hire an expert, provide him with a sounding board, and then to let him go ahead and write. We have not attempted to promulgate a party line for AAJC or for the OEP. We believe that the frank expression of opinion, however controversial and regardless of the extent to which any of us on the staff may concur, is bound to be beneficial in the stimulation of ideas and actions on the part of the readers. Two service area publications that I have had responsibility for are quite different in their approach, and yet both have to my mind performed valiant service. One is "The Role of the Advisory Committee in Occupational Education in the Junior College." It was written by Al Riendeau, then Dean of Occupational Education at West Valley College in Campbell, California, and now staff associate to Grant Venn, the Associate Commissioner for Adult, Vocational, and Library Programs of the U. S. Office of Education. This has a frankly empirical flavor of practical suggestions as to how to get the maximum benefit and support from local industry advisory groups.

The second, entitled "General Education in Occupational Education," is more philosophic in nature and will, I suspect, annoy a number of readers because it does not give specific answers to questions. This expresses the convictions of Bob Wiegman, Dean of the College of Education at Florida Atlantic University in Boca Raton.

Noteworthy also, I believe, is the publication for colleges in small communities called "100,000 and Under" and the series of general publications in the health field, in which we worked jointly with the National Health Council.

Another fact which became evident early in our discussions was that four individuals based in Washington could not give sufficient help to individual institutions. We, therefore, decided to identify potential consultants who can measurably extend our own activities. We can, upon request, supply names of persons with special qualifications to work with and at particular institutions. I have tried a technique in this program that I have found successful. I have gathered together a group of about 25 experts in a single discipline for a three-day meeting and fertilized with an addition of representatives from appropriate industries and technical societies. The results have been a stimulating meeting with presentations and extensive discussions on many of the factors pertaining to a curricular area. A number of you, I know, have participated. Everyone leaves those meetings with an increased awareness of the broad scope and great complexity of each field. Although identification and orientation of the consultants has been the primary purpose, an important by-product has been the publication of the proceedings on the Consultants' Workshop. The first such activity was in the field of Civil Engineering Technology. The workshop was held in Atlanta in May 1966 and the published proceedings were edited by Jerry S. Dobrovolsky of the University of Illinois. The second, concerned with Technologies Related to Mechanical Engineering, was held in San Antonio in May 1967; the proceedings were edited by A. J. Miller of Ohio State University. The third in the series will deal with the electrical field and will be held this spring.

The most enjoyable of our programs have proven to be the regional conferences. For our convenience we have divided the country into four regions: (1) those states in which collegiate programs are accredited by the North Central Association; (2) the region of the Southern Association; (3) that of the Western and Northwestern Associations combined; and (4) that of the New England and Middle States Associations combined. A conference is held in each region, on a rotating basis, every two years; thus, of course, we hold two such conferences each year. Since the AAJC annual convention seems to focus primarily on the needs of college presidents and board members, we try to see that our conferences have appeal for deans of occupational education, division and department heads. The main part of the three-day meeting is a series of discussion groups on selected topics; attendance at each group is limited to 25 and the entire conference to 125. The groups are scheduled so that each participant can attend a maximum of four different groups. The topics are selected to give visibility to OEP activities. For example, at the next conference the groups that I will arrange are on general education and on electrical technology, an obvious extension of those activities that I have previously described to you. The discussion leaders are persons who have generally been active within the OEP. In addition, there are several general session speakers, perhaps one panel session, and several lunches and other opportunities for those in atten-

dance to exchange news and views. Regional conferences have been held successively in Denver, New Orleans, and San Francisco. The next will be held in New York City next month (April 1969) and the one after that, for the North Central region, in Kansas City in November 1969. Announcements of application dates and of program are carried in the OEB. We cordially invite all of you to apply and to attend; a modest registration fee is charged.

In addition to all of these program activities, we have arranged with the Center for Vocational and Technical Education at Ohio State University to co-sponsor two workshops this summer. I will not describe these in detail, but will use them only as an example of the extension of our project program activities by meeting, corresponding, visiting, writing, speaking, consulting, and cooperating with other agencies in many, many ways on many, many occasions to keep in touch with whatever is significant for occupational education at the two-year college. In fact, these non-program activities account for about half of our time.

We are now in the fourth year of a scheduled five-year project. The grant will conclude, under present plans, on November 30, 1970. Although we have not built evaluation into the project format we believe, from informal evaluations, we have been fairly successful. But now we need your help.

We would like your evaluation of what we have accomplished. Please write us, anonymously if you wish, and tell us what you think.

We need your advice, further, about the directions in which the project might be directed if it were refunded.

We need your advice about the directions that AAJC should proceed in occupational education, in the event that the project is not renewed.

Whether you work in a junior college or not, we feel that we can provide a service for you. Please tell us how we can best help you.

TECHNICAL EDUCATION IN AMERICAN HIGHER EDUCATION

The Commission on Science Education of the American Association for the Advancement of Science welcomes the opportunity to participate in the program of the National Clinic on Technical Education.

The Commission, supported by the National Science Foundation, has an overall responsibility for the identification of problems in science education and the recommendation or administration of action programs directed toward their alleviation, especially in interdisciplinary areas or in areas which do not fall directly within the missions of other agencies. To date, the major activity of the Commission has been the development of a science education program for grades K-6, Science--A Process Approach. Materials for the earlier years of this program are now in use. The project will be completed in September 1969. Other interests of the Commission have been support of the International Clearinghouse on Science and Mathematics Curricular Developments, studies of the preservice education of elementary school teachers, out-of-school science learning resources, and junior college teachers of science and mathematics.

In 1966 the Commission appointed a subcommittee to begin a review of the status of science in vocational and technical education. As a first step, the Commission sponsored a session on technical education at the 1966 annual meeting of the American Association for the Advancement of Science. The papers presented at this meeting were published in the March 1967 issue of Science Education News.

At the February 1968 meeting of the Commission, it was decided that the problems of science in technical education are of such rapidly growing importance that they warranted increased attention. Accordingly, the status of the subcommittee on vocational and technical education was changed to that of a Task Force,* a small administrative staff was employed, and the Technical Education Project was launched within the same month.

The first major activity undertaken by the Task Force was the convening of the AAAS Conference on Science in Technical Education, which was held in Washington, D. C., on 22-23 July 1968. The conference was attended by about fifty leaders in technical education from government, education, and industry. Members of the conference gave careful consideration to a wide range of problems which had been grouped within three main categories: (1) The Place of Technical Education in the American Educational System; (2) Institutions,

*The present membership of the Task Force on Technical Education is as follows: Burton H. Colvin, Head, Mathematics Research Laboratory, Boeing Scientific Laboratories (Chairman); William T. Kabisch, Assistant Executive Officer, American Association for the Advancement of Science; William C. Kelly, Director, Office of Scientific Personnel, National Research Council; and Vincent J. Schaefer, Director, Atmospheric Sciences Research Center, University of New York, Albany.

Presentation by Dr. Howard F. Foncannon, Coordinator, Technical Education Project, American Association for the Advancement of Science, Commission on Science Education.

Students, and Teachers; and (3) Offerings in Technical Education Programs. The recommendations of the conference, and the conclusions of the Commission based on the recommendations, have been published by the AAAS in Technical Education: A Growing Challenge in American Higher Education.

The title of the report reflects the deep concern expressed many times in the conference about the status of technical education in junior and community colleges and technical institutes in the minds of the public and within other sectors of the educational system. The discussions brought out the feeling that many of the problems of technical education could be solved with comparative ease if the general public and the educational community recognized more clearly the differences between vocational, technical, and professional education, and that programs for the training of technicians are, in fact, at the level of higher education. (The conference limited its discussions to problems of education for the physical science related technical occupations, and did not consider the somewhat different problems in education for the technical occupations related primarily to the biological sciences.)

A basic problem in all of American education has been the assumption on the part of the public--and to a certain extent among educators--that there is increasing honor on the part of the student as he progresses through successively "higher" levels of education--and the same applies to teachers. There must come a realization of the simple truth that education exists equally to serve the needs of every individual, no matter how elementary are his talents and aspirations--nor how high. We measure the value of talents by the archaic and misleading standards of the "academic" scale; the value of work by the kind of uniform that the worker wears; and the value of teaching by the age of the children in the classroom.

When we speak of the "status" of technical education, we speak not of a degree of honor or respectability connected with it, but of the fact that it makes certain kinds of demands upon its students, and that they must possess certain kinds of talents to profit by it. We believe that it is important to state clearly that technical education is neither more nor less important than vocational education for the trades and crafts or education for engineers and scientists--but only that it is important if we are to accomplish the complex work of our society, and that its demands upon individual students requires talents to master certain kinds of knowledge and to develop certain kinds of complex skills that most appropriately belong in the sector of our educational system that we have come to view as "higher" education--whatever that may really mean.

It was pointed out in the conference that the combination and level of manipulative and cognitive skills and talents required by the highly trained technician are not well enough understood by high school students, teachers, and counselors. This results in choice of technical education programs by many students who are not suited for them, and rejection of technical education by many students who are qualified and who would do well.

Members of the conference discussed numerous other problems which have a bearing of one kind or another on the status of technical education--recruitment of qualified faculty, the formulation and administration of legis-

lation affecting vocational and technical education, accrediting of institutions and programs, the development of technical education curricula, and the attitudes of employers in recruitment and utilization of technicians, to name a few.

The recommendations of the conference urged that: "Greater efforts should be made to identify technical education more closely with higher education--but with the preservation of its unique mission and goals," and stated that: "The widespread misconceptions about the goals and nature of technical education, and about the kinds and level of work that technicians perform, should be dispelled by a vigorous program of public information."

The conference also recommended that: "Continuing study should be made of the various kinds of regulatory influences--public and private, voluntary and involuntary--that affect technical education. . . in order to make more evident the ways in which the best interests of technical education can be served through cooperation by agencies and organizations that have regulatory responsibilities and functions."

The conference noted that: "Federal and state legislative bodies have enacted important legislation intended to encourage and support technical education. Rapidly changing conditions require that this legislation be kept up-to-date. Technical educators and administrators should review these laws continually and provide advice to governmental legislative agencies for the amendment of existing laws or the enactment of new ones, as needed."

I believe that it is fair to say that there was a general agreement among the members of the conference that the most potent forces for strengthening technical education as a vigorous sector of American higher education with a clearly recognized identity will come from within the technical education community itself. In an era characterized by an erosion of values, technical education will need to resist pressures to lower the standards and criteria for excellence that have been established. There is need to develop much closer relationships with other sectors of higher education; the greater part of the initiative will have to come from technical educators.

The problems of determining the nature of the science and mathematics content of technical education programs requires much greater participation by scientists and mathematicians in other kinds of higher educational institutions. It has been demonstrated that scientists are willing and even eager to provide advice and assistance in this kind of activity--but the opportunities will have to be made clear to them by those who are responsible for the development of curricula and courses for technical education programs. A primary function of the State Academies of Science is to be of service to local institutions of many kinds. The establishment of cooperative relationships between community colleges and local members of the State Academies would almost certainly produce benefits that would be mutually advantageous.

In this era, education as a whole is undergoing a transformation. The focus of education is shifting from preoccupation with knowledge, per se, to primary concern with the needs of people. In the words of the Advisory Council on Vocational Education, ". . . never before has attention to the individual been so imperative."

The most difficult problem for technical education in the years ahead will be to respond adequately to the mounting pressures of social, economic, cultural, and technological change. Education has existed as an almost autonomous institution little affected by the forces generated in a society seeking maturity. In the span of less than a generation, however, education has moved from the hilltop to the storefront, and the staid old institution no longer is in full control of its own processes.

The need for change to meet new and emerging needs was recognized in the AAAS Conference on Science in Technical Education. The final recommendation was that:

A study should be made of new instructional techniques to discover those that may be adaptable to technical education. Information about them should be disseminated widely.

Much experimentation already is being done by technical education institutions in efforts to improve methods and general pedagogic approaches for technical education. These projects should be encouraged in every way and information about successful ones should be made available throughout the technical education community. Additional comprehensive experimental and developmental programs are needed, particularly ones that will seek to discover basically new approaches to the patterns of technical education in general.

In October 1968 the Commission on Science Education reviewed the report of the conference and concluded that "the need for educating larger numbers of highly trained technicians is reaching the critical stage, and there is as much reason now for national concern about technical education as there was for concern about the education of scientists and engineers two decades ago." The Commission also stressed the responsibility that has been placed upon higher education in general for the continued strengthening of technical education, especially in view of the increasing funds being made available for this purpose, and called for cooperation by employers and federal, state, and local governmental agencies in the overall effort. The Commission noted that technical education has not had the recognition as a part of higher education that it must have to accomplish its mission fully, and concluded that: "Major cooperative efforts must be made, as soon as possible, (1) to alleviate present problems in technical education as it now exists, while (2) experimentation proceeds to find new approaches that will make it possible for technical education to meet the rapidly changing and mounting demands of the future."

Thinking about imaginative new approaches to technical education should not be limited by models of organization and methodology that may have served in the past but that are too restricted and cumbersome to serve the needs of the future. Participation by students, leavened by the wisdom and experience of their teachers, in the fashioning of their own educational programs should not be ruled out. All of the developments of educational technology and learning theory should be carefully examined and tried if they show promise of increasing the effectiveness of the educational process. This is not to say that we should embark upon lightly considered, superficial deviations from tradition of the type that characterized much of the "progressive education" era in elementary school education. What we do say is that education is becoming increasingly complex, and that problems of curriculum building and of the development of instructional materials are, in themselves, a new tech-

nology requiring the expertise and participation of specialists of many kinds. Our task is to synthesize, to bring the diverse but essential elements together, and to create new learning situations that will be more effective than the old ones have been.

We are speaking not only of the substance and content of technical education, but also of organization and management. An example of a kind of new approach in this category has just been offered for consideration by the American Association of Junior Colleges in General Education in Occupational Programs Offered by Junior Colleges* in which a complete restructuring of the junior and community college offering both occupational and transfer programs is proposed. The essence of the proposal is contained in the following statement:

One of the persistent problems in the junior college today is the schism between the faculty and students in the occupational programs and the faculty and students in the transfer programs. Perhaps one way of bridging the chasm between the two groups would be to restructure the organizational patterns of the College.

Looking at the occupational programs which are offered, it seems that we should consider setting up the divisions in the college somewhat along these lines:

- Communications and related technologies
- Behavioral science and related technologies
- Social sciences and related technologies
- Science and mathematics and related technologies
- Humanities and related technologies

In other words, each division would include all technical offerings related to it. I believe that we could place each occupational program very appropriately in one of these divisions.

Many other serious efforts at innovation are going on in many places. The programs of the Technical Education Research Center (TERC) are illustrative, including the work of Dr. Maurice Roney and his staff at Oklahoma State University in the development of a multidisciplinary technical curriculum in Electromechanical Technology in which science, mathematics, technology, and communication skills are combined in an integrated program.

The Commission on Science Education proposed that the work of the Task Force on Technical Education be continued "in order to bring the needs of technical education more forcefully to the attention of the scientific community at large, and to enlist the assistance of scientists in efforts to improve technical education."

The Task Force was encouraged to seek ways to carry out several specific projects. Two of these were announced in the extra feature issued of the Occupational Education Bulletin of February 15, 1969. The first is a study of Innovation and Experimentation in Technical Education Programs, and the second

*Wiegman, Robert R., General Education in Occupational Programs Offered by Junior Colleges, American Association of Junior Colleges, Washington, D. C., 1969 (\$1.50).

is a study of Cooperative Work-Study Technical Education Programs. The Task Force will depend upon voluntary responses to these requests for information. Some responses already have been received.

Other activities that have been recommended to the Task Force by the Commission include working in cooperation with the NSF-supported College Commissions on the development of plans for the improvement of preservice and continuing education for teachers in technical education programs; analysis and evaluation of the science and mathematics components in a sample of technical education curricula to obtain a clearer view of the problems that need to be attacked; a review of the relevance of science and mathematics offerings to the needs and interests of high school students who may be candidates for technical education; examination of the feasibility of developing an entire technical education curriculum in an emerging or neglected technical field, employing to the greatest practical extent the most productive aspects of modern learning theory and the most effective techniques of modern educational technology; and preparation of an analysis of a sample of outstanding technical education programs to determine the factors that contribute to their success.

In conclusion, although technical education in junior and community colleges is even now a large-scale educational enterprise, it is still young. Its many problems are well recognized. Its form and processes are modeled generally after patterns that are rapidly becoming outmoded and inadequate to meet the needs of the future. Technical education is, indeed, "a growing challenge in American higher education." There is opportunity--in fact, obligation--on the part of every administrator, department head, and faculty member to help fashion new approaches and new systems, without particular reference to the past. There is opportunity for imagination and innovation in higher education on an unprecedented scale. From now on, if formal education is to succeed in this country, the school must look first to the student and his needs rather than coldly serving out its predetermined "offerings."

It is true that in the public mind the technical division of the junior and community college does not have the "status" that it ought to have. There has not yet been time, and its mission has not yet been clearly recognized. Technical educators and the administrators of their colleges should look to the creation of a new kind of institution where the students know that their needs are being met. The reason that the problem has not been solved is that it is so complex. It is certain, however, that as new rational and meaningful ideas appear there will be support from the community, state and federal governmental agencies, and the scientific community in general.

The Commission on Science Education and the Task Force on Technical Education wish to express appreciation to members of the technical education community, and to those in government and industry with whom we have worked, for the wholehearted cooperation that we have received. We see our basic mission as being to help bring scientists and technical educators into closer cooperation, and we believe that this can be done in many ways. We feel that something has been accomplished in this first year, but that whatever the Commission and the AAAS can contribute in the future will depend upon the continued assistance and advice from you and your colleagues.

RESEARCH

We appreciate the opportunity of presenting information from the Research Handbook for Vocational-Technical Education to this group. We shall examine the salient features of the handbook in this presentation. Later on in the day you will have an opportunity to discuss points which should be emphasized or de-emphasized. My remarks are taken directly from the handbook. They are a product of consultants' papers and the discussion which occurred during the National Conference on Research which was held in Oklahoma.

We would like for you to become acquainted with the individuals who served as consultants for this conference.

Mr. R. D. Anderson, Executive Secretary, National Association of State Directors of Vocational Education.

Dr. George Brandon, Advisor to the Director of the American Vocational Association.

Mr. David Bushnell, Director, Division of Comprehensive and Vocational Education Research, U. S. Office of Education.

Mr. Thomas Clemens, on leave from his position as Director of the Division of Information Technology and Dissemination, U. S. Office of Education.

Mr. Leonard Lecht, Director, National Planning Association's Center.

Mr. Joseph Malinski, Director, Vocational and Technical Program Planning, Minnesota State Department of Education.

Dr. Jerome Moss, Co-Director, Minnesota Research Coordinating Unit.

Mrs. Chrystine Shack, Supervisor of Business Education for New Jersey.

Dr. Gordon Swanson, Professor of Agricultural Education, University of Minnesota.

Mr. Lawrence Walsh, Senior Editor of Distributive Education, McGraw-Hill Book Company.

These consultants represent a broad spectrum of the institutions related to or directly involved in vocational-technical education. They were willing to share ideas from their fields of endeavor. Hopefully, these ideas are incorporated in the text of the handbook. This project was charged with the responsibility for interpreting the research aspects of the 1968 Amendments. To do this, one must discern the intent of Congress.

Effective July 1, money has been authorized for research in vocational education at the state level. This means fifty new decision points for allocating monies in research. State-level personnel must be prepared to administer these funds wisely and efficiently. This requires staff understanding of the research process.

Presentation by Dr. William L. Hull, Oklahoma State University

The 1968 Vocational Education Amendments authorize money for research in Part C for the following three areas:

1. Research and training. The term "research" has been interpreted by our project team in its broadest sense to include implementation of research findings as well as the conduct of research. In other words, research must be related to program planning and may include student follow-up records by state agencies and the stimulation of innovative effort. In this same category, authorization has been given for training programs. Presumably, this includes preparing practitioners to interpret and implement research findings as well as the development of state staff researchers.
2. The second category represents an intermediate step between research activity and utilization of research findings. In this step research projects would be launched as pilot programs for refinement and development. These projects must have outcomes which are useful to vocational education. In other words, negative results cannot be tolerated in this category.
3. The final authorization involves the dissemination function. Methods must be devised to insure rapid utilization and implementation of research findings.

Traditionally, research has not been oriented to practice. It has concerned itself with the advancement of scientific knowledge, the building of theory, and academic disciplines. It has been conducted within controlled laboratory conditions, frequently by graduate students. Consequently, it left many practitioners worried or, at best, confused.

P.L. 90-576 has mandated a change from confusion to optimism about the direction of research. These monies are to be used for program revision and development. In this sense, we might call it programatic research in that it is mission-oriented. In other words, questions asked by practitioners need answers and the tendency will be to fund projects on the basis of questions which have the greatest need and import for the state. Secondly, this research from the very beginning will be designed for dissemination and utilization by practitioners. This demands that practitioners, or we might say vocational teachers, should serve on advisory committees to assist in the developing of priorities for research. And finally, we note that throughout a state's research and development program the ultimate goal is improvement of existing practices. This connotes an attitude of flexibility, a willingness to change the system. In order for research to function as an evaluative force in vocational and technical education, state staff must provide an atmosphere and climate of change.

Jerry Moss and Joe Malinski presented a research and development model at the National Conference on Research. It included nine salient features which we shall describe briefly. First of all the term "subsystem." Dr. Moss and his colleagues view this model as cutting across all of vocational and technical education. This is the same sense in which the Senate subcommittee described research as the "cutting edge" of vocational education.

1. Research must be conducted in order to have information for dissemination and improvement. Some agency in the state should be designated as being primarily concerned with state research. This would be necessary even though a state may have a number of colleges and universities already doing research. It should be pointed out that the function of basic research was assigned by our conference participants to national and regional levels.
2. Developing curricular offerings may be viewed as an ongoing activity which becomes a constant need. Curricula are always out of date in that they never catch up with existing demands or future changes.
3. Program evaluation must be related closely to research studies. Evaluation is not research, but it is aimed at program revision and renewal activities.
4. Stimulating research effort may well become one of the critical activities within a state. It implies a willingness to adjust to changing conditions. Much effort may be spent by state staff in working with local educational personnel on this function.
5. Inventing models for research in a theoretical context may be left to university people. However, applied models for dissemination of results should be present in any pilot or demonstration program.
6. Responsibility for stimulating the conduct of applied research needs to be assigned to some state department agency. This function deals with problem solving--frequently on a question-by-question basis. It is difficult to make evaluations and chart proposed program changes without evidence of existing program effects. For example, before a state may attempt to assist disadvantaged students, information must be obtained on the numbers of students with particular kinds of handicaps. This is applied research.
7. The administration of research monies under P.L. 90-576 may well determine the likelihood of continued appropriations by Congress. Within the next five years evidence must be obtained to show efficient and effective use of research funds within each state.
8. Conducting training activities may be considered a function of the research subsystem. It is frequently overlooked. It is impossible to receive quality performance from personnel without technical competence on their part. Consequently, there is a pressing need to update and develop competency in research for state staff. Likewise, a reciprocal need exists among vocational teachers and administrators within public and private school systems to learn how to use research findings.
9. Disseminating results of research should receive high priority from state planners. Each state must develop some type of technical information system for dissemination and implementation of results.

Congress expects an efficient use of research monies. The 1968 Vocational Education Amendments authorized in Part C the support of Research Coordinating Units up to 75 percent of the cost. This underscores the importance of elimi-

nating duplication of effort and the need for utilization of research results. Research coordinating unit personnel may be viewed as change agents within the system. These people consult with advisory committee members on directions for change within vocational and technical education, and they review research proposals submitted by local educational agencies. This review may include technical assistance in some cases in the writing of proposals.

States which include a limited number of qualified researchers may ask a research coordinating unit to conduct research studies in vocational and technical education. Also, disseminating the results of research work must be viewed as a primary responsibility.

In order to compete in this twentieth century and keep pace with rapid technological development, vocational and technical education research must take a systems approach. A major part of this approach includes technical information. This system should have the following capabilities: it should include two-way communication. Local educational agencies attempting to submit proposals for innovative effort need information. This information should be available on a local, county, or district basis. Eventually, most states will want to develop a computer-based output for rapid dissemination of technical information.

So one flow of information is from state offices to local school systems. A second flow of information is in the reverse direction. Local educational agencies should have channels open to state departments. Through these channels innovative ideas might be projected or developed through research proposals to be funded and tried out initially on a small scale. Instruments developed at the local level might be channeled first to the state office and then conceivably on to the ERIC system through the vocational and technical education center of ERIC located at the Ohio State University.

People who function in the role of change agents are familiar with the adoption process. They know that target audiences react differently to different forms of communication during different stages of this adoption process.

This is why it is necessary for a technical information system to provide a variety of outputs for different audiences. This demands various abilities on the part of dissemination experts. Findings from research on dissemination indicate that sources of information nearest the consumer are the ones which will be used. If practitioners in vocational-technical education cannot interpret results of research studies there is zero likelihood of these findings being accepted into regular programs. Information sources must be accessible; and, in the final analysis, practitioners prefer to have a person interfaced between them and the research data.

In other words, personal face-to-face communication is preferred at the practitioner level. If the state staff has been successful in disseminating research results, the way has been paved for soliciting ideas for innovation.

Channels and procedures must be devised for processing research proposals. Initial proposals may be brief, perhaps a single page. Some states have tagged these "miniproposals." This initial preview should be in-house, conducted by state staff personnel. After the proposal receives an initial favorable review,

it should be returned to the authors for development. The revised proposal would be submitted in multiple copies in order for it to be sent to various review team members. The individuals serving as reviewers on this second stage should hold some competency in the particular area of the proposal. Their judgments of the proposal should be compared with priority areas devised by an advisory committee before funding takes place.

An advisory committee made up of constituents and the clientele of vocational and technical education within the state should be engaged to develop priorities for research and development. This function approximates policy-making within the system. It is critical to the advancement and program development of vocational and technical education within the state.

The functions in the Moss model should be assigned to particular state agencies. For example, the program-planning and evaluation functions should be separated to insure a limited number of people with vested interests on evaluation review teams. Annual budgets for research proposals and funding are recommended. This provides more flexibility for change and insures a minimum level of competition for research monies. Both contract and grant monies may be desirable for research. This depends on how the priorities are specified. Monies should be ear-marked for different kinds of categories. High priority needs can justify soliciting proposals from particular educational agencies. Secondly, specific priority areas may be listed as research needs. Local educational personnel should attempt to design their proposals to meet these needs. Finally, a category should be designated as non-solicited. The local vocational teacher with a good idea should have an opportunity to channel this idea to the state office and receive consideration of it despite its relevance to priority areas. This may encourage brain-storming effort by vocational teachers.

To be effective each state must develop an organized plan for using research findings. Haphazard activity on the part of undifferentiated agencies throughout the state can result in much duplication with circular results. The intent of Congress in supporting research coordination efforts is to eliminate this duplication and construct a system which allows for continuous renewal and innovation.

Such a system cannot take place without continuous training and retraining. We must be alert to the needs for workshops and in-service education of vocational teachers. This need is apparent in the utilization of research findings.

Primary responsibility for coordinating research efforts and developing long-range plans for program improvement lies with the U. S. Office of Education. Research personnel in this office must look ahead by funding basic research projects. Hopefully, they will be able to inform the states of their priorities and activities in sufficient time to cut down on similar effort on the local level.

This handbook has been written to assist local and state leaders in vocational and technical education. Quality research can point the way to an improved vocational and technical education system. We solicit your criticism of this presentation and of particular statements in the handbook itself.

RESIDENTIAL FACILITIES

It was the Oklahoma State University's pleasure to host the recent National Conference on Residential Vocational Education on its Okmulgee Branch campus. I am, of course, referring to the vocational-technical branch school referred to as Oklahoma State Tech, and I am referring to the conference which had as its purpose the writing of the national guidelines for Residential Vocational Education as set forth in Part E of Public Law 90-576--the 1968 Amendments to the Vocational Education Act of 1963. Let me set the stage by reviewing some of the points I set forth as Principal Investigator in 'The Role of the National Conference'.

For nearly twenty-three years this residential branch of the Oklahoma State University has advocated, promoted, and worked diligently to successfully operate a residential vocational school. To those of us who have seen this campus grow to become the largest two-year campus in Oklahoma (a state with many state supported colleges and universities) it is indeed confusing and alarming that we should just now be involved in developing national guidelines for a national network of similar schools.

In a nation whose landscape has, since the 17th century, been covered with in-residence post-secondary academic educational institutions, it is indeed strange that none, or terribly few, of these campuses have specialized in vocational-technical education. Why have we waited so long to give this necessary phase of education the pleasure of prestigious, student maturing campus life? Was the blacksmith any less important in the days of our forefathers than is the highly specialized automotive service technician of today?

Many of our citizens, both young and old, deserve a vocational education opportunity other than that of being a "second-class student" on an academic campus or a "step-brother student" in a secondary educational program. To infer that programs are similar to the technology that is found on the academic campus or in the secondary education programs is inadequate. In spite of the similarity, we do not send medical students to veterinary colleges. In spite of all the new vocational programs, there is still a void.

Perhaps the national conference, the follow-up regional meetings, and meetings such as this will form the ammunition for a shot of knowledge, interest, and enthusiasm that will be heard by those who prepare national educational budgets. We must develop a plan befitting the interest shown in legislation that has set forth residential vocational education as an important part of the Amendments (1968) to the Vocational Education Act of 1963.

Vocational education cannot--even residential vocational education cannot--solve all the social and unemployment problems of our great nation. Perhaps some of our associates have at times left this impression. To be sure, there have been those not in vocational education who have asked this of us--after spending millions of dollars on other programs. We have only to look about us to see that some people will not conform to an educational program leading

Presentation by Dr. Wayne W. Miller, Oklahoma State Technical College.

to useful work--nor will they work regardless of the dollars available to them. Many free educational programs with living expenses paid have failed to reach a certain percentage of the population. But let me loudly proclaim, we have served and can continue to serve in RESIDENTIAL VOCATIONAL EDUCATION a vast proportion of the population that has been virtually overlooked.

In recent years of greatly increased interest in vocational education, we have used the term "make vocational education available to everyone." Many persons have interpreted this phrase to mean that every citizen should be able to look out his window and see a vocational school. It has been our contention since the early days of the Vocational Education Act of 1963 that "making vocational education available" can and should be answered partly through residential vocational education. The wise use of our dollars demands it. The need for quality vocational education demands it. The desires of many, many prospective students demand residential vocational education.

IN THE FINAL ANALYSIS WE SHALL NOT BE MEASURED BY HOW MANY VOCATIONAL SCHOOLS ARE CONSTRUCTED IN THE UNITED STATES BUT BY THE PERFORMANCE OF EMPLOYED GRADUATES FROM A GIVEN NUMBER OF QUALITY SCHOOLS.

The residential school can and must serve the needs of the disadvantaged whether he be a dropout or a disillusioned product of an inadequate national education program.

Attending the National Conference were educators from a wide variety of educational institutions, a number of industries, and several governmental agencies. Naturally some came with ideas, philosophies, and desires based on their experiences, needs, and perhaps hopes. It would seem some participants felt the residential vocational school should duplicate the educational activities of one or more existing kinds of schools.

I find no words in the law stating that this residential vocational education is to replace or duplicate any present nationwide system of education such as the residential or nonresidential junior college, the residential or nonresidential comprehensive community college, the technical institute, the area vocational technical schools, the residential job corps centers or existing MDTA skill centers. These are defined, well known, funded educational programs. Surely we must assume our national legislators authorized a phase of education unlike the more widely known schools presently in existence. To be sure, some of these schools are now enrolling students who would be better served if residential vocational education was available. We must, in my opinion, assume these yet unfunded residential schools must project a different philosophy and a different image than the aforementioned educational institutions. The residential vocational education school must attract, and that is the key word, and serve prospective skilled craftsmen and industrial technicians who find present schools undesirable, unsuitable, or unavailable. Very few schools in the United States today serve the role of residential vocational education. It is my pleasure to be associated with one such institution.

The legislation is broadly written even though narrowly interpreted by some who see the opportunity for their particular project to receive federal funds. During the National Conference, for example, it was interesting to

note some states would like to see dormitories constructed at the site of all area vocational schools. Weren't area schools designed to serve those who needed to commute, who needed to stay at home while attending school? Surely we cannot write guidelines that directly contradict the purpose of such existing schools. Residential vocational schools must serve those not now being reached by such schools--either by geographical location or lack of course offerings due to expense.

This we know--residential vocational education schools cannot be all things to all people. Such schools cannot serve as an umbrella covering all vocational needs for all people. It must, however, be a specialized vocational school with a philosophy that is different--that will attract a blend of students--the conforming, serious minded student, though he be from the lowest income strata, must make up the majority of the student body. The desirable pattern can well raise the sites, goals, and behavior of the nonconforming number. A school serving primarily the nonconforming, undesirable student is certain to bring the entire group down to his level.

THE SCHOOL'S ROLE IN COOPERATIVE OCCUPATIONAL EDUCATION

There is too much visibility of American affluence for any segment of American society to accept hunger, poverty and unemployment as a natural and acceptable state. The ability of an individual to share in the good life that is becoming the goal of every American relates to the quantity and quality of education that has relevance for living successfully in today's world. If education is to be relevant to today's needs, it must include certain basic educational knowledge and skills plus preparation for entering and progressing in the world of work. This means that the school must satisfy this requirement by attempting to meet the needs of all youth in a variety of innovative ways.

The problem carries a challenge but it must be approached with an urgency that recognizes the complexities that have been produced by a number of factors.

1. The Rapidity of Change and Its Effect on People

- 1) More change has taken place in the past 50 years than has taken place in all previous time since the world was created.
- 2) Ninety percent of all the scientists who ever lived are alive and at work right now.
- 3) Two-thirds of the products that we will buy in 1980 have not been thought of yet.
- 4) Fifty new nations have come into being since 1950.
- 5) One-half or 50 percent of the children now in the 6th grade, in 1980 will be working at jobs that are not now in existence.
- 6) Two-thirds of the people in the world have a per capita income of only a few hundred dollars per year, and about one-third of the population of the world has a yearly per capita income of less than \$100.
- 7) Fifty percent of the world's adult population or about seven hundred million persons are illiterate. Of the world's adult population, only about one-half attend school. This has strong implications for the free world as we try to sell the developing countries on the concept of "freedom with responsibility."
- 8) One hundred developing countries lack mass media to keep the population informed. Three-fourths of the world's books are produced by 10 countries, and 70 percent of all translations are limited to four languages: English - French - German - and Russian.

Presentation by Dr. Elizabeth J. Simpson, Acting Chairman, College of Education, University of Illinois of a paper prepared by Dr. H. I. Willett, Superintendent of Schools, Richmond, Virginia for the 1969 National Conference on Cooperative Vocational Education.

- 9) Perhaps this whole picture can be placed in perspective by making a comparison of the job requirements and the educational requirements of 1930 as compared with the estimated requirements in 1970, as shown by the following table:

TABLE OF
OCCUPATIONAL TRENDS AND EDUCATIONAL REQUIREMENTS
U. S. Labor Force - 1930 and 1970

LABOR FORCE

	Unskilled	Semi-Skilled	Skilled	Clerical and Sales	Semi-Prof'l.	Manager'l.	Prof'l.
1930	32 %	25 %	10 %	15 %	4 %	8 %	6 %
1970	5 %	21 %	12 %	20 %	20 %*	10 %	12 %
* <u>Note</u> : This semi-professional percentage includes technical labor force.							

EDUCATIONAL REQUIREMENTS

	Grade School or Less	High School or Vocational	Junior College, Technical Institutes, Etc.	College
1930	58 %	32 %	--	10 %
1970	6 %	26 %	50 %	18 %

Data in this table taken from presentation of Norman C. Harris, Professor of Technical Education, The University of Michigan, to the SREB Legislative Work Conference, Williamsburg, Virginia, August 28, 1964.

- 10) Dr. Richmond Bellman, mathematician at the Rand Corporation, predicts that 25 years from now two percent of our population will be able to produce all the food and goods that the other 98 percent can possible consume.

2. The Explosion of Knowledge

The explosion of knowledge that is now taking place has important meaning for the school program. Someone has estimated that knowledge doubled between 1700 and 1900; that it again doubled by 1950 and again in 1960; and it can be expected to continue to double about every ten years. Someone

else has expressed the disquieting thought that a person entering college as a freshman knows a higher percentage of the total amount of knowledge than he can expect to know when he graduates.

This increase in knowledge has strong implications for us. The first point refers to the selection of information and curricula content. It is increasingly difficult, if not impossible, to offer survey courses that give even a realistic glimpse of all of the knowledge in a particular field and expect such survey courses to be taken by all pupils. The increase in knowledge means, then, that we must be more selective in the materials to be given to all pupils and more selective of materials that must be given to selected pupils.

3. The Population Explosion and Urbanization

In 1965, 60 million Americans, or over 31 percent of the population, were less than 15 years of age. When Thomas Jefferson founded the University of Virginia, only about 10 percent of our people lived in cities and towns. Today about 70 percent live in cities and towns. By the year 2000, five out of every six Americans will be city and town dwellers. They will occupy a relatively small geographical area representing about two percent of the total land of the United States outside of Alaska.

Dr. Roger Revelle, Director of the Center for Population Studies, Harvard University, in a speech before the American Association of School Administrators, had this to say:

"It will mean that our government and our country in the future will be essentially a league of cities, of city-states, like the Athenian League at the time of Pericles, but these cities will be of monstrous size, unlike anything the world has ever seen - giant urban complexes, which have been called 'megapolises.' One might be called 'Atlanticopolis;' it will extend from Portland, Maine to Richmond, Virginia - a continuous strip city."

It is evident that by the year 2000 we will have a world population of at least 6 billion, which will represent one-half the people that have lived since the beginning of recorded history.

It must be recognized that perhaps the Number One domestic problem facing the country at this time is associated with the concentration of a high percentage of our disadvantaged in the central cities of America. This concentration has produced a situation where those requiring the most services are the least able to pay for those services. Such a concentration of poverty, frustration and unemployment threatens the safety, security and economic well-being of this nation. The cities that used to be the citadels of wealth are now, in most cases, close to the brink of bankruptcy.

This flight to the cities on the part of those with few skills and the flight from the cities of those with more skills and better educational opportunities is in part the result of the dramatic change that has been taking place as we have tried to adjust to the transition from an agricultural society to the electronic and computer age.

WHY ARE COOPERATIVE OCCUPATIONAL PROGRAMS OF IMPORTANCE?

1. With the high degree of specialized training that is required in today's society, it is not feasible for the schools to provide all the shops and laboratories that are necessary for occupational training.
2. A closer partnership between the schools and the occupational world is necessary in order to maintain the proper relevance of training to the skills that must be performed. This relevance of both the skill training and the basic subjects to support the occupational training provides the greatest motivation when the individual can see the relationship of his educational training to the job that will support him and his family in the years ahead.
3. In most occupational fields there are many levels of training which can best be met in a cooperative enterprise. These levels of training relate, of course, to the needs of society and also to the ability and interest of the pupils that must be served.
4. The partnership approach offers avenues of involvement and planning between the schools and the business interest, which can be most helpful in maintaining programs that are relevant. This approach also affords an excellent opportunity for the schools to gain greater support for the school programs.
5. The cooperative approach also has strong implications for staffing the occupational program. It is very important for a teacher-coordinator to understand the school program and also to understand the general techniques and requirements of the occupation. On the other hand, it is increasingly difficult to secure teachers with the educational background who possess the current skills to teach a specific occupation.

Under the cooperative program, it is possible to select a teacher-coordinator who will be supervising and coordinating the work of technicians in the occupational field. This cooperative approach more nearly resembles the techniques used by the Armed Services whereby one professional may be supervising dozens of technicians who are working directly with the students. This plan enables the students to receive more individual help than is normally possible in the typical school occupational shop.

A cooperative program of occupational education must be designed to meet the needs of all pupils ranging from slow learners and retarded, who may have to work in sheltered workshop situations, to those students who will go from high school on to continued training in college. In meeting this wide range of occupational demand, the school could never hope to provide activities to meet all these needs within the framework of the school organization itself.

This contact with the business world is not only essential in developing a specific skill but it also has an important guidance function in enabling youth to gain a better understanding of the occupational world that makes it possible for them to select more intelligently their field of work.

BRIEF DESCRIPTIONS OF CERTAIN PROGRAMS AND PRACTICES THAT EXIST IN THE RICHMOND PUBLIC SCHOOLS

In presenting certain programs and practices in the Richmond Public Schools, the purpose is not to suggest that this particular city has adequately met even the majority of its problems or fully accepted the many challenges that face school systems today. However, it is the program that the writer knows best and which may serve to stimulate discussions both in terms of what is and what is not being done.

Time, of course, will not permit a discussion of all programs, but hopefully a few of the more innovative approaches can be described in the field of cooperative occupational education.

Let us look first at some of the cooperative programs that are more typical in the regular comprehensive high schools.

Distributive Education (DE)

The community is beginning to recognize the fact that the field of distributive education is very closely related to what many pupils are going to do in the occupational world since 43 percent of the labor force in Richmond is employed in the areas of distribution and services. However, only 11 percent of the total school enrollment in grades 10 to 12 were in distributive education last year but this does represent an encouraging increase over the enrollment of five years ago.

Approximately four thousand adults enrolled in distributive programs last year and approximately two hundred fifty students are enrolled in the junior high school program which is offered for the first time this year. The program is being offered this year as a pilot study. Its success, however, suggests that a very large enrollment is projected in the junior high school for next year. It is important to reach some youth at an earlier age and this particular program on the junior high school level offers a very encouraging opportunity.

The greatest need in distributive education is for program expansion especially in the areas of programs for out-of-school youth including those with special needs.

Distributive education is a fine example of cooperative instruction, requiring the joint interest and efforts of the schools, the distribution industry and the community. All three benefit thereby: the schools by providing meaningful instruction, the employers by obtaining more efficient personnel and the community through better consumer services and more prosperous, efficient businesses.

There are many specific goals described in the program but there are three major goals:

- provide an educational program for all the citizens in the Richmond area from ages 14-90 plus, who can benefit from training in marketing and distribution

- prepare individuals for employment in the field of marketing and distribution

- encourage individuals to continue their education.

Vocational Office Training (VOT)

Another program that is based in the comprehensive high school is called the "Vocational Office Training Program." (VOT) In most states, however, this program is referred to as "Cooperative Office Education." (COE)

The program is under the direction of a "VOT Coordinator" who must be a certified business teacher with a minimum of two years teaching experience and 480 hours of on-the-job office experience before qualifying for the position. This person usually teaches three classes and has the rest of the time for locating and selecting desirable work stations, evaluating the student on the job, consulting with employers, making community surveys, making and using job analyses, establishing and maintaining parental consent, preparing related instructional units, and interpreting the VOT program to the community, faculty and student body.

The primary goal of the VOT program is economic productivity for all students who will not be going on to formal education. An important secondary goal is the acquiring of skills and knowledge which will enable the student to obtain a part-time job as a secretary, bookkeeper or office clerk while enrolled in college to help the student defray part of his expenses.

One of the weaknesses in this program has grown out of the fact that adequate cooperative training has not been provided for the low ability business student. An attempt to correct this situation is directed toward moving into what is called "New Curriculum Patterns for Office Occupations Education." These fall into five main occupational training patterns: Stenographic and Related Occupations, Clerical Accounting and Related Occupations, Data Processing and Related Occupations, Typewriting and Related Occupations, and Curriculum Patterns for Youth with Special Needs. These programs are designed to provide education in skills and concepts common to clusters of closely related office occupations. The relevancy to cooperative education is that all cooperative business students will no longer be in one single VOT class at the 12th grade level, with diverse office career objectives.

A cooperative work-study class for youth with special needs is now in the developmental stage. This program will be initiated in the next school year. The class title is "9 Clerical Services" and it will be a two-hour block of time in which ninth and tenth-grade low or under-achievers will be enrolled. This pilot class approach will get cooperative office education down to the lower grade levels where the potential dropout may be saved.

This might be as good a place as any to point out the importance of teacher attitude and teacher expectations for the disadvantaged. The following quotation was taken from Business Education Forum (original source footnoted as: Rosenthal, Robert, and Jacobson, Lenore. "Teacher Expectations for the Disadvantaged." Scientific American, April, 1968.)

"Most business teachers come from the middle class and neither understand nor have empathy for their inner-city students. They anticipate poor performance and thus teach students to fail. In a recent research study teachers were told that test results of certain students indicated that they could be expected to perform exceptionally well."

Actually the students named were selected by random numbers and had not shown superior potential on verbal and reasoning tests. The experimental method involved nothing more than giving their names to their new teachers as children who could be expected to show unusual intellectual gains.

"At the end of four months, at the end of the first year, and at the end of the second year the entire group was retested. The students expected to spurt showed significant gains in intelligence over the nondesignated children. Even more important, though, is the perception of their development by their teachers. They thought that this supposedly superior group developed greatly in social skills. The teachers perceived the other group as growing steadily poorer in social skills. The more its members actually gained in intelligence, the less favorably they were rated by their teachers. They were designated as not well adjusted, less appealing, and less affectionate than the students labeled superior.

"The researchers suggest that inferiority in educational accomplishment lies not entirely in the child and in his environment; that at least some of the deficiencies may be in the attitudes of teachers toward children from disadvantaged backgrounds."

Cooperative Work Training Programs

The "Cooperative Work Training Program" offers opportunities for students interested in industrial education. These programs were originally known as the "Diversified Occupations" (D.O.) They are now known as "Industrial Cooperative Training Programs" (I.C.T.) Students work in cooperative programs such as baggage handling, building maintenance, cooking and food service, meat cutting, draftsman, photo engraver, audio visual repairmen, mechanical production workers, telephone operators, industrial laboratory aides, stockroom operators, and cosmetology.

The I.C.T. program can meet a real need in the community by providing supervised work experience for those boys and girls desiring to enter an industrial type occupation.

Students are admitted to the program in a manner very similar to the DE and VOT programs. They work in various industries and are paid on an hourly basis for the work performed. Many of these students find permanent employment with the same company or employer for whom they worked while under the I.C.T. program. This is also true of both the DE and VOT programs.

SEVERAL SPECIAL PROGRAMS

Vocational Rehabilitation

One of the most encouraging and innovative programs has been developed in cooperation with the Virginia Department of Vocational Rehabilitation through its cooperative agreement with the Richmond City Schools. This program includes between eleven and twelve hundred students who have emotional, physical or mental handicaps that relate to their future employment.

Each pupil has or will have an individual plan of action drawn up for his future by him and his counselor. This plan may be for a college education or a kitchen helper's job at a cafeteria. The plan depends upon the ability, interest, work capacity and motivation of the student.

In order to be served, a student first must be referred to vocational rehabilitation by the school. After referral, a rehabilitation counselor interviews the client, refers him for diagnostic medical, psychological and vocational information. The family is contacted and plans are formulated for the student.

The vocational rehabilitation counselor works with the business community to secure the best job or on-the-job training for a person of his client's talents. This may involve reimbursing the employer so that it is worthwhile for him to give the client the needed supervision in his initial job placement. The placement may come as a result of the counselor making plant surveys or may be the result of counseling the student as to the proper attitudes and ways of doing a job interview. Many techniques are used as the condition seems to warrant.

The program for the Richmond City Schools is made up of three units:

First, the Basic Unit receives referrals from all junior and senior high schools. The counselor may have any client with any type of disability on his caseload.

Second, The Richmond Trades Training Center Unit provides evaluation for, training in, and job placement for specific areas of employment. At the present time these include barbering, cosmetology, health services, food services, woodworking, painting and decorating, welding, commercial sewing, and shoe repair. Other services are soon to be added. This program is housed in two specific centers, one for boys and one for girls. Part of the laboratory work is carried on at the new Richmond Technical Center. The strength of such a program grows out of the fact that large blocks of time in laboratory and related activities can be specifically directed toward one trade. For example, in the food service the arithmetic problems have to do with units of measure, reductions or expansions of recipes, cost of food items, and an attempt is made to keep everything relevant to the trade that the student is preparing to enter. Furthermore, the program provides great flexibility in activities. These students do not expect to earn a high school diploma; therefore, emphasis can be placed where it can achieve the greatest result in terms of the interest and ability of the student. Some students work one-half day and attend laboratory exercises at school for one-half day, or attend related instruction for one-half day and then go to work. The needs of the individual determine the program.

This program is in its infancy and there are problems of supervision of students at a great variety of locations. The age of fifteen is rather young for some students to make this type of choice relating to his future; however, the flexibility of the program means that these students can still earn a high school diploma if their interest and achievement level so indicates. If such a program is not started early with youth, they drop out of school before they become eligible to enroll.

Third, The Operational Rehabilitation Training Unit (ORT) has as its goal to reach dropouts and youth who are not succeeding in an academic environment. Training areas have been identified within the Operations Department of City Schools in which there is a great demand from the local labor market for employees. These areas include furniture repair and refinishing, custodial services, painting and decorating, outside building and grounds maintenance, nurses' aide, cafeteria floor girl, and the servicing of automobiles. In this last connection the school system operates a filling station in which filling station attendants are trained.

These programs are designed to reach dropouts and potential dropouts who normally will not complete high school. They will be put through a specific training program with related basic skills. As soon as they have been trained for a particular job they are passed on to the job counselor, who then follows the young employee on the job in order to give further assistance and to evaluate with the employer and the employee the success of the program.

The first commencement exercises of the Operational Rehabilitation Training Program (ORT) was held at the Richmond Technical Center on Friday evening, January 24, 1969, at which time 109 certificates were awarded to those pupils who had qualified for certificates of achievement in six areas of training, which were custodial maintenance, food service, health aids, horticulture, service station operation, and woodworking.

Richmond Technical Center

Reference should be made to a new technical center that has been opened this year and which has some implications for the cooperative education program.

This center is under the operation of the Richmond School Board but serves students from 20 high schools in the metropolitan area. At the present time there are some 20 programs which include: commercial sewing, sheet metal work, welding, radio and television electronics, printing trades, practical nursing, plumbing and pipe fitting, masonry, machine tool trades, industrial electronics, industrial drafting, heating-air conditioning-refrigeration, diesel engine mechanics, commercial foods, commercial electricity, cabinet making and mill-work, automotive mechanics, architectural drafting, automated data processing, appliance servicing, auto body repair, with uncommitted space for the development of still other programs to meet the needs of the community.

The building has a maximum capacity to serve one thousand students at a given time. It serves one group of students in the morning and another in the afternoon, which, of course, makes a capacity of two thousand students in the daytime program plus an equal number of adults in the evening program if two shifts are operated. In fact, some programs are operating on two shifts for adults as well as for students.

The daytime program is designed primarily for students in the last two years of high school. A given student spends one-half day in his regular school and one-half day at the center. A plan is now being developed whereby students may transfer from the laboratory in the center to a cooperative program in business and industry. Or, a student may have completed high school and continue specific training in the technical center on a cooperative basis with business and industry.

The feeling has developed already among the staff at the center that a number of students have progressed satisfactorily during this first year to the point that next year some of them can profit most from on-the-job experience. The 1968 Amendments to the Vocational Act should serve to implement this program.

Potential employers have been contacted and they expressed considerable interest in a cooperative arrangement whereby the student can work part-time two, three or four days for an employer and then come to the center for the remaining days of the week. The 1968 Amendments provide financial assistance for an employer if he is unable to pay the minimum hourly rate for such students. However, the employers who have been contacted feel that most of the students will be able to earn the required wage.

SUMMER PROGRAMS

Project Build

The creation of Project BUILD in the summer of 1968 was a constructive action taken by the Richmond Public Schools in its attempt to remotivate the high school dropout or potential dropout. The program was developed to help the young people help themselves to a more rewarding school experience than many of them had known. The program was carried out under the authority of the National Elementary and Secondary Education Act of 1965, and was conducted at six high schools within the city and, therefore, divided into six separate projects as a center for individual BUILD groups. Each of the six groups consisted of 50 enrollees and seven staff members. The staff of each program had a coordinator or supervisor. Working with the coordinators were three professional teachers who were responsible for classroom activities and supervision in general. Assisting the teachers were three aides, (for the most part these were successful college students) who helped enliven work and study projects and served as a buffer between faculty and students. To supervise the six projects and maintain a unity among the participating schools, a chief coordinator directed the city-wide program.

Each staff sought to combine work, study and recreation into a unified program. A primary concern was to financially aid the students. Therefore, a program of work was set up within each school or nearby community. The students engaging in the work were paid \$20 per week for their useful services. Because the enrollees worked for money, they were constantly reminded that this was not a handout. However, the remunerative aspect of the program served as an inducement for dropouts to return to school.

The students in the program took a number of field trips to places of significant interest throughout the city, state and nation.

A great deal of emphasis was placed on having the pupils involved in the selection of both work, study and recreational activities.

The program had strong implications for better racial understanding since there were a variety of activities that brought the youth together from the various school centers particularly in recreational activities and in a culminating project which brought all of the youth together for a final exercise including a dinner.

The students spent much time in discussing topics that were current for them on both a local, state and national level. The work on school and community projects helped to develop a responsible attitude toward school and community.

The program was deemed to be an outstanding success and many things were learned that will enable a still better program to be developed in succeeding years. The program also had strong implications concerning what can be done in motivating youth. The teachers who worked in this program will perhaps never be the same again as they work with youth in their classes.

Richmond Chamber of Commerce Job Program

Another summer program has received national attention. This was a cooperative program worked out with the leadership of the Richmond Chamber of Commerce and included the Richmond Community Action Program, the United Givers Fund Agency, the Richmond Area of Community Agency, agencies of the city government and the Richmond Public Schools. The Richmond Chamber of Commerce provided jobs. One of the unique aspects of the program was that five youths held one job. Each youth spent one day on a job in the community for which he was paid by the business or industry, and one day working in the community in a service capacity as he rendered service to a nonprofit organization, public improvement or needy individuals. He was paid for this day's work out of OEO funds. This made a total of two days for which he was paid and which gave him an income of something over \$25 per week. One day was spent in recreation; and two days were spent under the supervision of the schools in a variety of educational activities - but it was not school in the usual sense.

Here again the youth played a big role in determining their educational activities and perhaps the people who learned the most from this program were the teachers who developed an awareness of the fact that youth who had been considered hopeless could achieve when properly involved and motivated.

The culminating activity was a graduating exercise in which the youth took part in a commencement exercise at the City Auditorium (Mosque) where some eleven to twelve hundred youth received certificates of achievement. A member of this group made one of the speeches at the commencement exercises and, without the use of notes, he made the best speech that was given which included speeches from the Mayor, the President of the Chamber of Commerce and the Superintendent of Schools.

The work of these youth and their generally fine performance have done as much as any one single thing to show to the community what can be done with the disadvantaged.

One of the business concerns which employed approximately 100 of these youth kept a record of their attendance and punctuality, and found that these disadvantaged youth had a better record than their regular employees.

It was interesting also to note what happened to the dress and general conduct of these youth as they observed their colleagues in the places where they were working.

Still unresolved is the problem of coordination between vocational education and the rest of the school program. This chart includes an assistant superintendent for instruction and an assistant superintendent for occupational and continuing education. These administrators will need to work very closely together. The superintendent and associate superintendent will need to give some overall coordination.

In order to implement the kind of program that will meet the needs of all youth, consideration must be given to the administrative organization and design required in a school system that will provide such a program. It has been suggested that some consideration be given to administrative design for a city of approximately three hundred thousand population. What is proposed here is more or less traditional in design, which should serve for discussion purposes, with particular emphasis on the part dealing with vocational education.

ADMINISTRATIVE ORGANIZATION AND DESIGN

The use of paraprofessionals offers a great resource not only for the help that they give to the professionals but also for their ability to establish rapport and better communication with the disadvantaged youth. It is also significant that the paraprofessionals working as aides and in other capacities become highly motivated to improve their own educational qualifications.

Have schools really been organized to meet the needs of all youth?

There must be much greater involvement of youth, parents, teachers and the community in developing cooperative programs.

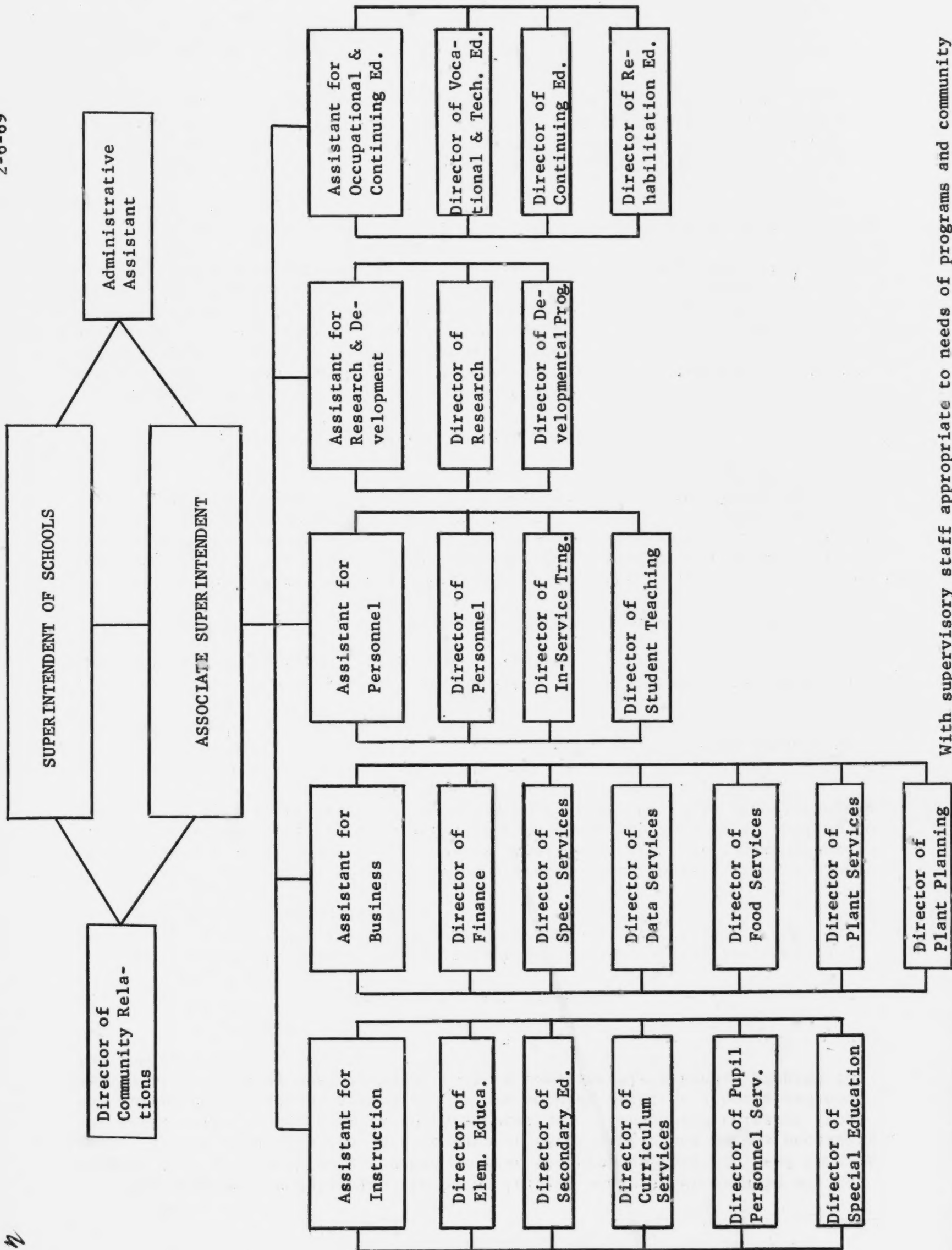
The program of vocational cooperative education is handicapped by the egg crate scheduling that still is present in most American high schools including Richmond.

In the first place, the individual approach is essential. Programs must be designed in which youth can proceed at their own rate. It is important to utilize more of what is known about basic learning, not only as it applies to cooperative vocational training but as it applies to the total school program.

Many important lessons are being learned from these programs that have strong implications for the total school program as they relate to how youth learn and how they are motivated.

SOME LESSONS FROM EXPERIENCE

The program was determined to be an initial success but this is not to suggest that all youth were reached or that the program does not need improvement. It was developed too late to have as careful planning as was necessary. The coordinator of the program for last year has already been released from his duties in the school system and is now working with the schools and community in developing what is hoped to be a considerably expanded program for the coming summer.



The primary job of the person in charge of the total vocational program would be to coordinate activities with the rest of the services in the school system. Vocational programs are too much fragmented at the present time. In vocational education, programs are still confined too much in little compartments that are almost as unrealistic as the high school scheduling that is still maintained. There is need for larger blocks of time and more concern with the relevance of curricula content and teaching techniques to the needs of youth in today's world.

Too little is known about the psychological workings of the mind, but there are some interesting developments in physiology that have strong implications for the schools particularly as they concentrate on problems of poverty.

Recent studies suggest that the absence of amino acid in the diet of the mother and the early life of the child will cause defects in the development of the brain cells that cannot be corrected at a later date. For example, it is known that the child's brain develops to 80 percent of its normal size in the first three years of the child's life whereas his physical body develops to only 20 percent of its normal size in this same time.

Some interesting experiments are being carried on in the use of protein substitutes. Products from soybeans resembling steak, chicken and other meats have been developed; and a corn impregnated with amino acid has been developed to be used as a meat substitute. These new developments suggest that the effects of undernourishment in the early life of the child may be one of the most serious factors affecting his potential intellectual, social and vocational development.

PLANNING - COORDINATION - EVALUATION

What is the relevance of basic education to the needs of the child in the cooperative program? Some children can learn through practical application what they cannot learn in theory and this applies specifically to the disadvantaged child and to what he may achieve through a cooperative occupational enterprise.

Part G of the Vocational Amendments of 1968 can have great implications for the development of cooperative programs if the necessary funds are made available and if a breakthrough is made on the shackles of regimentation and fragmentation. The best thinking of school people and the business leadership must be involved in taking an innovative approach in seeking better solutions to many of these problems. It is time for all educators, and particularly those interested in various aspects of vocational education, to really put on their thinking caps as to how the resources set forth in Part G of the new act can best be used to serve the youth of this nation.

There must be continuing dialogue with the youth served by the schools. For example, during the past two years Richmond has had a rather intensive program directed at the dropout and potential dropout. In order to keep close to this problem, the writer attempted to meet at each high school with those dropouts who had been persuaded to return to school. These discussions produced

some very helpful results. Some of the programs that were initiated have been the result of suggestions made by these dropouts. For example, discussions included such problems as

Why did you drop out of school?

Why have you returned?

Imagine that you were Superintendent of Schools, what would you do to change the program of the school so that it would be more appealing to those students who are now dropping out?

What can the community as a whole do to build fences against the developing youth hostility that is found in so many places throughout the country?

Perhaps the most rewarding part of these sessions was to have a dropout come up to the Superintendent and say: "You will never know how much it means to us that you care enough to come here and talk with us about these problems."

A part of our responsibility is to develop programs that have meaning for all youth in which they can see some purpose. This does not mean that such programs have to be easy, because schools must challenge the best in youth.

None of us have all the facilities and resources that are needed. (Personally I would like very much to have as a resource for the city of Richmond a farm on which there might be a resident school providing a combination of work-study experiences for students who could not be kept in the home, and to which might be transported for a day program those students who could remain in the home but who need something very different from what is now offered.)

It must be remembered that there should be only two exits from school -- into a job and on to continuing education.

Before the problem of the disadvantaged or the school dropout can be solved, they must be helped to create images of themselves in which there is ambition and a willingness to work to achieve goals that are realistic for them and in which youth can establish their own identity.

There is perhaps no resource in the school that offers a greater challenge and opportunity for certain youth as cooperative occupational education, because a youth must find himself in relationship to his job and in relationship to his responsibilities to his community.

I would like to close with a quotation from James Michener's Fires of Spring:

"For this is the journey that men make: to find themselves. If they fail in this, it doesn't matter much what else they find. Money, position, fame, many loves, revenge are all of little consequence, and when the tickets are collected at the end of the ride, they are tossed into a bin marked Failure. But if a man happens to find himself - if he knows what he can be depended upon to do, the limits of his courage, the position from which he will no longer retreat... the secret reservoirs of his determination, the extent of his dedication, the depth of his feeling for beauty, his honest and un-postured goals - then he has found a mansion which he can inhabit with dignity all the days of his life."

CURRICULUM DEVELOPMENT

PURPOSE OF THE NATIONAL CONFERENCE ON CURRICULUM DEVELOPMENT IN VOCATIONAL AND TECHNICAL EDUCATION

The national conference was one of nine national conferences designed to bring together representatives of business, labor, government, and education and other interested citizen groups for a discussion that assisted in establishing a framework for the implementation of Part I of the 1968 Amendments. The conference provided a forum to examine, discuss, and develop a series of guidelines interrelated with the following six conference objectives:

1. To design a system for the production and dissemination of curriculum materials.
2. To establish standards for development and maintenance of curriculum efforts.
3. To develop an optimum plan for coordination of all national, state, local, and private sector efforts in curriculum development and production.
4. To review the nature and availability of curriculum materials of the Armed Services, of other government agencies, and of the private sector.
5. To develop criteria for evaluation of curriculum materials and for utilization of such materials.
6. To suggest plans for preparation of professional personnel in curriculum development.

Results from the national conference are now presented to the nine regional clinics being held throughout the nation so that other groups can make further suggestions and refinements. The final outcome of the national conference and the nine regional clinics will be a guideline document that will assist the schools in the nation to implement Part I of the 1968 Amendments.

CURRENT TRENDS IN CURRICULUM THEORY AND DEVELOPMENT

Abstract

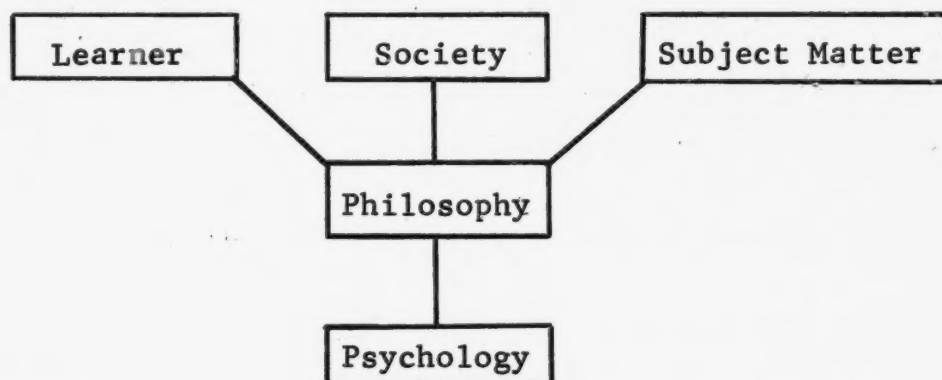
Louise L. Tyler
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This paper outlines some of the current trends in curriculum theory and development. Discussion about curriculum development is limited to formulation of goals, selection of learning opportunities, and evaluation. However,

Presentation by Dr. Melvin Barlow, University of California at Los Angeles, of a summary of discussion groups and abstracts of speeches presented to the National Conference on Curriculum Development in Vocational and Technical Education, March 5, 6, and 7, 1969, Dallas, Texas.

two screens are employed, philosophy and psychology. Philosophy is utilized in order to eliminate inconsistencies and inconsequentialities; psychology is utilized to determine feasibility, compatibility, and specificity of objectives. These commonplaces are discussed in a way so as to raise questions concerning assumptions about the conception held about education, whether it is technological or humanistic.

Discussion on curriculum theory is concerned with how theory can be developed so that education as an art based upon science can become innovative.



Conceptualization by Ralph Tyler of the major factors in Curriculum Development

DISCUSSION OF TYLER'S PRESENTATION

The discussion of Tyler's presentation was made through the learning technique utilization of the modified definition and discussion by the group with Dr. Tyler.

Question: What is the place of theory in developing curriculum?

Answer: (1) Terms get you bound in a certain kind of system which is hard to change.

(2) Curriculum experts do not agree on the definition of the word "curriculum."

(3) Standard definitions state that a course of study should contain all the experiences that come under the aegis of the school.

Question: Should students play a part in developing or formulating goals?

Answer: (1) Students should formulate objectives. For self-actualizing autonomous individuals, you should make it possible for them to formulate their own goals. The value premises are involved when students formulate their goals.

Question: Why do you prefer Ralph Tyler's way of stating an objective rather than Mager's?

Answer: (1) Tyler does not indicate the degree of attainment which, when stated, runs contrary to normal differences of students. Mager's objectives are formulated for programmed instruction. It is closed-ended, and in teaching, objectives must be open-ended. The classroom teacher must make a thousand decisions a day in terms of interaction with students and no teacher has the ability to maintain, in his or her mind, the kind of objective that

Mager would have formulated for instruction. Teachers who have had training with behavioral objectives appear not to use them in the instructional setting.

Question: Do educational colleges have to be either humanistic or technological?

Answer: (1) No, colleges may be both.

Question: How do we get students to participate in development of objectives?

Answer: (1) This is now being done in Head Start programs and in elementary schools.

(2) Teachers through observing how well students perform after leaving the classroom can ask them for their assistance in formulating objectives for new students coming into the program.

Question: Should a school provide a course of study and should the student be able to say, "I don't agree with the objectives of the course of study."?

Answer: (1) Schools should provide the course of study and should be sensitive to students' objections to the course's objectives. After all, they are the ones whom the community will employ in the end.

(2) Some doctors who turn out to be successful were not known to be effective in medical school. This may have been a result of the course of study being not in line of their learning needs, or there could be other reasons.

THE FUTURE OF VOCATIONAL CURRICULUM DEVELOPMENT

Abstract

Gerald B. Leighbody

The funds which become available for vocational curriculum purposes from the 1968 Vocational Amendments Act will not be used wisely:

1. If they are spent to develop curriculums for high school students to prepare them for specific occupations. This should be planned for those who have left or completed high school.
2. If they are used largely to produce instructional materials instead of the development of curriculum.
3. If they are used to produce instructional materials in competition with commercial suppliers.

Vocational curriculum development must be based upon the same conceptual foundations and curriculum theories which are accepted and used in other areas of education.

The majority of workers will always need to learn their occupations on the job, not in schools. The notion that in-school, formal vocational education should be provided for all students who do not achieve a baccalaureate degree is a myth. It is based on a number of erroneous and unrealistic assumptions. Only a few of the thousands of occupations in our economy can ever become a part of the school curriculum.

Basic general education is vocational education. Therefore, vocational curriculum makers must include it in their planning.

Career orientation and decision making is an inseparable component of vocational education. Therefore, a major investment of vocational education curriculum resources for this purpose is warranted. The vocational curriculum during the high school years should be largely in this area, not in training for specific job skills.

Teachers will make little use of curriculum structures or materials which have been developed without their participation. Persons from several learning disciplines, not vocational specialists alone, should be involved in vocational curriculum development.

DISCUSSION OF LEIGHBODY'S PRESENTATION

The discussion groups were asked to present their ideas as to the role and function of the educational agencies at the national, state, and local levels in attacking the problems presented. The composite thinking of the seven groups was:

National Level - U.S.O.E.

1. Identify, and provide for the dissemination of curriculum materials available from the armed forces, business and industry, and other national groups.
2. Keep all lists of such material "updated" at least every two years.
3. Provide an inventory of curriculum material needed on the national level and establish procedures for coordinating the efforts to supply these needs.
4. Develop and provide a set of guidelines which will contain sufficient information to assist the states in establishing proper criteria for the development of curriculum materials.
5. Identify exemplary state or local programs of curriculum material development that really function.
6. Develop and coordinate plans for the exchange of such materials between states.
7. Where desirable assist in the development and operation of regional centers for the development and dissemination of curriculum materials.

State Level

1. Establish one or more centers for the development and dissemination of curriculum materials.
2. Provide for the professional growth and development of local teachers in the area of curriculum materials development and use.
3. Assume responsibility for the development of curriculum materials in those areas of common interest to local programs in the state.

4. Work with the U.S.O.E. in developing plans for the exchange and distribution of curriculum materials between states.

5. Provide leadership and encourage the development of curriculum materials on the local level.

6. Establish plans for workshops in the development of curriculum materials which will involve local teachers.

7. Establish criteria for both the development and evaluation of curriculum materials.

Local Level

1. Identify the needs for curriculum material within their community.

2. Use "two-way" communication between the school and business and industry in the selection, development or adaptation, and use of curriculum materials.

3. Where justified, establish curriculum materials centers for both the development and demonstration of the use of curriculum materials.

4. Establish procedures that will allow teachers to participate in desirable national or state workshops relating to the development of curriculum materials.

5. Provide for the dissemination of information regarding available curriculum materials to all vocational teachers.

6. Establish and maintain a constant program of evaluation of both curriculum materials and their use.

EVALUATION OF CURRICULUM MATERIALS AND THEIR USE

Abstract

W. James Popham
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What the classroom teacher has always known is now being perceived by an increasing number of influential American educators, namely, that the single most important determiner of the curriculum is the set of curriculum materials on which instruction is based. Since the influence of curriculum materials is enormous, any evaluation of them must be commensurate with their potential impact.

Prominent among current criteria used to evaluate curriculum materials are those of content, cosmetics, and charisma. It is distressing to realize that considered separately or as a pooled collection these criteria are completely inadequate for the proper evaluation of curriculum materials.

The most defensible criterion by which to judge the adequacy of curriculum materials is the degree to which those materials, if used as directed, can consistently bring about desired changes in the behavior of the intended learners.

Evaluations based on publisher's data, efforts of neutral agencies, and USEF data each can contribute to the legitimate evaluation of curricular material, as long as that judgment is made in a criterion-referenced context.

A useful procedure to facilitate the employment of a criterion-referenced strategy is the emergence of the Instructional Objectives Exchange, an agency designed to provide institutional objectives and test measures from which educators may select. Implications of the Exchange for curriculum evaluation are examined.

DISCUSSION OF POPHAM'S PRESENTATION

Question: What are the essential differences between a "means-referenced" and a "criterion-referenced" approach to the evaluation of curriculum materials?

Answer: (1) "Means-referenced" approach pertained to the procedures used in teaching an instructional unit; the "how" it is taught.

(2) "Criterion-referenced" approach pertains to the desired behavioral changes that occur as a result of the instructional unit; in other words it reflects an end-oriented approach to instruction.

(3) It was agreed that for vocational-technical curriculum materials the evaluation should primarily be based on the "criterion-referenced" approach, but secondarily that some use of the "means-referenced" approach should be used also.

Question: What are the key ingredients of a properly stated instructional objective?

Answer: (1) They must be student oriented.

(2) They must involve specified, measurable terminal behavior.

(3) They must indicate the conditions under which behavior is to operate.

(4) They must include criterion measurement by which success or failure of having achieved the desired terminal behavior can be judged.

(5) Objectives should be specific. Occupational analysis should be used to make the objectives specific.

Question: Should the instructional objectives exchange concept be applied to vocational and technical education?

Answer: (1) The objective exchange concept should be applied to vocational-technical education with a built in system for constant evaluation of the objectives and feed-back to the exchange. There is an immediate need of this for those lists of objectives now available.

(2) Lists of specific objectives will enable the vocational teacher to a better selection of those fitting the course. Any such "laundry list" of objectives should also have a "laundry list" of motivating factors.

(3) Teachers should have a better preparation in the development of specific objectives that relate to terminal behavior. This means more emphasis on this subject in both pre-service training and in-service workshops.

Question: How can educators be encouraged to employ a "criterion-referenced" scheme in evaluating curriculum materials?

Answer: (1) Behavioral objectives for vocational education should be emphasized by U.S.O.E. in its cooperative efforts with state and local educational agencies. The U.S.O.E. should serve as the "catalyst" in gaining support for "criterion-referenced" objectives.

(2) In evaluation emphasize as to whether the objective is being met, not as whether it is relative.

(3) It will be necessary to use advisory committees, representative of business and industry, in evaluating "criterion-referenced" objectives.

(4) If teachers are to be convinced that the "criterion-referenced" scheme is better for evaluation, then administrators and supervisors must begin by emphasizing evaluation of outcomes of instruction rather than putting primary emphasis on the visible means of instruction.

Question: How can the developers of curriculum materials be encouraged to supply better data for evaluation purposes?

Answer: (1) A systems approach to the entire area of curriculum development should be used with evaluation being applied to complete the cycle and provide information for the revision of method, media and objectives. Evaluation of this material must be a two-way street, with the producers providing appropriate data for evaluation, and the users giving back the evaluation results.

(2) Must have a better training for vocational teachers in evaluating on a result-oriented basis.

(3) Agreements with curriculum materials laboratories must contain provision for the development of data to be used for evaluation. Teachers must "feed-back" the results of evaluation to the producers to stimulate continued interest on the part of producers in furnishing this data.

CURRICULUM AND CURRICULUM MATERIALS FOR VOCATIONAL EDUCATION

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Any person concerned with the important area of curriculum organization for vocational education must first become familiar with learning theory, psychology of learning and principles of curriculum organization. The paper presented suggests that curriculum for vocational education must be organized on the basis that:

1. Preparation for initial job entry is a basic responsibility of the public education program.
2. The curriculum must be goal centered at age 16 years and above and for most youth this goal can be most meaningful when related to preparation for employment.
3. Curriculum changes are necessary in our public schools in order to make the curriculum more relevant to the social and economic conditions of our day and the maturity of our youth.

4. A core curriculum concept, based upon the occupational goal of the student, can provide both a meaningful preparation for employment and a means of education of youth to participate effectively in our technological society.
5. A curriculum must concern itself not only with the need for knowledge and skills but also with the total educational, economic, social, and physical needs of each student.

A series of guidelines for the development of sound curricular materials might be listed as follows:

1. Reasonable Basis in Authority.
2. Accurate Technically.
3. Adequate in Scope to Cover the Learning Unit.
4. Written at the Educational Level of Students.
5. Divided into Simple Learning Units.
6. Organized for Individual Use.
7. Provide for Individual Student Response and Learning Evaluation.
8. Easy Procedure for Teacher Checking of Student Achievement.
9. Attractive in Appearance.

The following guidelines are suggested for the evaluation of the vocational education curriculum. A curriculum should:

1. Be organized around the student's goal.
2. Be psychologically sound.
3. Be experienced centered.
4. Cover skills, technical knowledge, work habits and attitudes, supportive educational services and evaluative techniques to analyze student achievement.
5. Provide for individualized instruction.
6. Include sufficient time or time blocks to adequately cover the program.

Curriculum development starts with a job and ends with a student on the job technically competent and able to succeed.

DISCUSSION OF SHOEMAKER'S PRESENTATION

Question: What are the strengths and weaknesses of the present curricular patterns in relationship to the social and economic problems of our day?

Answer: (1) Present curricular patterns are primarily oriented toward college preparation rather than student needs and goals.

(2) There is a decided lack of exploratory instruction about the world of work at all levels in the public schools.

(3) The curricular patterns are usually content oriented, involving rote memory processes and fail to provide the life applications with which the student can identify.

(4) Vocational education, on the secondary level, should be broadly based.

(5) Vocational education must also emphasize social development.

(6) Vocational education must constantly be concerned with general training for life--to a much greater degree than at the present time.

(7) All educational curricular patterns should be more concerned with the social and economic patterns of today.

Question: How does the concept of curriculum development in vocational education differ from that for our college preparatory and general curriculum?

Answer: (1) The vocational education curriculum must be more individually oriented than the general or college preparatory curriculum.

(2) Basically there is very little difference in the procedures for curriculum development--general, college preparatory, or vocational.

(3) Vocational education is primarily concerned with the development of both skills and mental abilities, whereas the other two are primarily concerned with the development of mental abilities only.

Question: What factors in the organization and content of a vocational curriculum relate to: (a) needs of people, (b) needs of society?

Answer: (1) The curriculum must be goal centered at age 16 or above and for most youth this goal is meaningful when related to the preparation for employment.

(2) Curriculum changes are constantly needed in vocational education in order to make it more relevant to the rapidly changing social and economic conditions.

(3) A core curriculum concept based upon the occupational goal of the student can provide a meaningful preparation for employment and also a means of education to enable the student to participate effectively in our technological society.

(4) A vocational education curriculum must concern itself not only with the need for knowledge of skills, but with the total educational, economic, social, and physical needs of each student.

Question: What guidelines should be established as a basis for the development of a vocational curriculum?

Answer: (1) A curriculum should:

(a) Be organized around student goals.

(b) Be organized to serve society's social and economic goals.

(c) Be psychologically sound, based upon the laws of learning.

(d) Be experience centered.

(e) Cover skills, technical knowledge, work habits and attitudes, supportive educational services and include evaluative techniques to analyze student achievement.

(2) The curriculum must be based upon job analyses which include the following major units related to the job:

- (a) Work units, jobs or operations.
- (b) Skills and work practices.
- (c) Safe practices and safety precautions.
- (d) Equipment, tools and materials.
- (e) Applied mathematics as related to the job.
- (f) Applied science as related to the job.
- (g) Specification and blue print interpretations.
- (h) Occupational information and terminology.
- (i) Work habits and attitudes.
- (j) Personal relationships--job related.
- (k) Physical capabilities required.

Question: What are the steps in the development of a vocational curriculum and the key points to be considered under each step?

Answer: (1) Make an occupational survey of the community.

(a) Check to determine if allowance for growth has been made.

(b) Check manpower needs and make a timetable.

(c) Establish public relations program.

(2) Survey the student body to determine student interests.

(3) Survey school facilities to determine:

(a) What facilities are available to meet existing needs.

(b) What additional facilities are needed.

(4) Select specific occupational areas that can best be served by the school. Which levels can profit by the training most effectively.

(5) Establish advisory committees, representing labor and management, who can assist in developing a curriculum.

(6) Determine how the vocational curriculum will provide for student exits at the proper entry level. Be sure to include the need, if it exists, for the student to return for further training on a part-time basis.

(7) Establish procedures for evaluation of the curriculum.

Establish follow-up procedures.

Question: What are the steps in the development of a vocational curriculum and the key points to be considered under each step?

Answer: (1) Determine the occupational needs of the community for entering workers.

(2) Determine student interests.

(3) Determine what resources are available to be used in meeting the community needs. Ascertain what additional resources will be needed.

(4) Check to determine if proper allowance for growth has been used.

(5) Establish target occupational areas that can be most effectively served by the school.

(6) Determine at what level the training can best be done.

Question: What are the principles of learning and learning theory reflected in: a vocational curriculum; a college preparatory curriculum; a general education curriculum?

Answer: (1) Vocational education (or career education) should be integrated as a vital inseparable part of the total educational program from kindergarten through the 16th grade level.

(2) Evidences of occupational education need to be readily identifiable in the elementary, secondary, post-secondary and adult educational systems.

(3) Vocational education is based on the assumption that the most effective learning is what can be put to immediate use.

(4) Specific goal oriented education is education for a job, thus vocational education cannot be considered as merely a supportive phase of general education. Vocational education must have a partnership role with general education rather than a supportive one.

(5) Society must recognize that the educational goals of most youths do not include preparation for college and hence must make provision for meeting their needs.

(6) The interest stimulated by the Vocational Education Act of 1968, among general educators, provides an opportunity for vocational educators to involve these general educators in developing educational programs that include vocational education on a partnership basis.

Question: What content area or areas of emphasis should be included in a vocational curriculum?

Answer: (1) Essential basic academic areas necessary for successful participation in the world of work.

(2) Occupational orientation on a broad base.

(3) Information directly related to the area of interest, with proper provision for the needs of the more "advanced students." (Enrichment centered)

(4) The specific job training content of the curriculum must be developed with and approved by an advisory committee.

Question: How do factors of scheduling school organizations, facilities, and equipment affect the curriculum?

Answer: (1) Scheduling should support the curriculum, not restrict it.

(2) Occupational education must be oriented so as to meet the needs of the individual student, hence needs the maximum of flexibility in scheduling.

(3) While a maximum of flexibility is necessary, it must be recognized that each school must set its own pattern.

(4) In some instances it will be necessary to lengthen the school day in order to gain needed flexibility.

(5) Modular scheduling (using blocks of time) can be used to meet many problems.

(6) A much greater use, timewise, of school facilities will be necessary to provide for proper scheduling.

(7) State plans for vocational education should provide information on methods of carrying out a comprehensive program of occupational education on all levels that will allow for flexibility in scheduling programs.

TRAINING OF PERSONNEL IN CURRICULUM DEVELOPMENT

Abstract

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The charge given to vocational-technical education requires an extensive corps of highly competent curriculum personnel to work continually for the improvement and adjustment of curriculum and to build new instructional pro-

grams for new occupations. An attempt is made in this paper to suggest a framework for training the personnel needed by:

1. Identifying basic assumptions underlying vocational-technical curriculum and regarding curriculum leaders.
2. Reviewing the competencies needed by curriculum personnel.
3. Sifting from that which is known about learning a few principles which can be applied in training personnel.

Assumptions made include those based on social demands, legislative directives and curricula theory. The competencies described suggest the possibility of using teams to secure the expertness required for curriculum work and indicate the need for personnel working at different levels of curriculum development.

Two principles of learning reviewed are: (1) learning is facilitated when the learner perceives that which is to be learned as important and immediately useful, and (2) learning requires the active involvement of the learner. Application of these two principles to training curriculum personnel point to more creative use of media and in-service training experiences and internship programs for potential curriculum leaders.

DISCUSSION OF HILL'S PRESENTATION

Question: What are the political implications in regard to curriculum development?

Answer: (1) Through social dynamics, changes are made. These changes are brought about by various influences in the community.

(2) In relation to political implications, it is important to get feedback from the various social influences concerned with the school program.

(3) Through the use of advisory committees planning for curriculum which is more easily facilitated.

Question: How do we train curriculum personnel?

Answer: (1) Graduate programs designed specifically for the training of curriculum personnel can be developed.

(2) The use of regional laboratories having provisions for internships or assistants to curriculum personnel, will in turn provide more personnel capable of developing curriculum.

(3) Through in-service activities bringing together individuals responsible for curriculum in various schools, curriculum ideas can be discussed and new methods and techniques can be developed. This in turn provides for dissemination as well as assists in training.

Question: What preparation, training, and/or qualifications would be appropriate for the developers of curriculum material?

Answer: (1) Time off could be provided for department heads so that they have sufficient time to learn how to develop curriculum and participate in workshops or in organized teacher training programs so that they may gain the skill for curriculum material development.

(2) Teacher training institutes should develop specific programs for the training of individuals who in turn will develop curriculum materials.

(3) State and local educational agencies should develop and operate in-service programs for the further development of curriculum personnel.

DISCUSSION QUESTIONS FOR REGIONAL CLINICS

1. (a) To what extent should vocational curriculums be concerned with basic general education material that will be of value to the students socially and economically?

(b) What safeguards can be used to avoid or reduce duplication or overlap with the general education material?

2. The task of developing curriculum materials is very large. Where should the major emphasis be placed:

(a) Materials for the use of teachers.

(b) Materials for the use of students.

3. How important is it that content material be included in the vocational curriculum?

4. Should the dissemination or distribution of curriculum materials be through: (and why)

(a) U.S.O.E.

(b) Regional Centers.

(c) State Offices.

(d) Other agency.

5. In evaluating curriculum material, emphasis was placed on the need for "producers" including criteria for evaluation with the material. It was also agreed that unless there was adequate "feedback" from the local teachers to the producers as to the results obtained in the use of the material, it would seriously reduce the effectiveness of the evaluation criteria. What procedures to obtain this "feedback" would get the best results?

6. The subject of regional curriculum centers is frequently discussed. Such centers can be a part of the functions of the regional offices of the U.S.O.E. or can be established as a function of state institutions of higher education or be a separate independent agency, under contract.

(a) What type of organization would be most likely to provide the best service to a majority of states?

(b) How can the needs and interests of the local teacher be handled most effectively by such centers?

7. There is a large amount of curriculum material available at the present time from many sources such as: Armed Forces; governmental agencies; national groups; state agencies and local agencies.

(a) What procedures should be established so as to better assist the local teacher in making the most effective use of it?

HEALTH TECHNOLOGIES

I have been asked to speak briefly on the health technologies. Actually, in surveying the entire field in order to determine which health technology would be offered by the St. Louis Junior College District, we found that there were more than 200 such technologies, probably 130 to 150 that might legitimately be offered by a junior college. There are such widely divergent areas as: (1) Bio-Medical Engineering Technology [the service of the wide variety of hospital equipment]; (2) Intensive Care Technician [which can be subdivided into care of the "Acute Stroke," care of the "Acute Coronary," etc.]; (3) Operating Room Technician [a one-year program, this person would replace the rapidly disappearing scrub-nurse]; and (4) Prosthetics [the making and fitting of artificial limbs].

Most of us are relatively new in this area of the health technologies. We certainly are far from expert in all of them. I would like to confine my remarks to those health technologies that we have selected and are offering at the Forest Park Community College, since I feel a little more knowledgeable about them.

The St. Louis Junior College District, in 1965, applied for and received a grant of \$168,168 to research this entire area of the allied health fields. A hospital administrator, Mr. Harry Davis, was selected to head the program. Three other members of the team consisted of a biological scientist, a physical scientist, and a social scientist. Each of these three were to spend the first year entirely with the project; the second year each was to work one-third time in his discipline; the third year two-thirds time teaching; and in the fourth year become a full faculty member.

The objectives of the Kellogg Study were:

1. To determine the para-medical areas which most urgently needed personnel.
2. To develop curricula for each.
3. Implement the programs.
4. Publish the results so it would be available nationally.

Six programs were selected for development:

1. Clinical Laboratory Technology.
2. Dental Assisting.
3. Dental Hygiene.
4. Radiologic Technology.
5. Medical Office Assistant.
6. Food Service Supervision.
(Nursing was already in operation)

The Allied Medical (and all other technical programs) offered in the Junior College District are incorporated into the academic division with which

Presentation by Dr. Oliver H. Duggins, Chairman, Life Science Division,
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it is most closely associated. (This is a key part of the program.) The students in the academic and technical programs intermingle. Insofar as possible, they are enrolled in the same classes. The same counselor serves both. There is no distinction between academic and technical students and faculty. In fact, it is somewhat prestigious to be in a technical program.

The Core Curriculum is one of the most talked about, but the least demonstrated concept in Allied Medical programs. A strong effort needs to be made in this direction. It is one of the ways in which we can reduce costs by combining students from the various technical areas. We have a common course in Communications, Chemistry of Human Function, Social Relations, Technical Mathematics, Technical Physics, and others.

A problem here is that these are designed for technical courses and do not necessarily carry transfer credit. We have trouble "selling" this fact to the various technical accrediting agencies--they still feel that a two-year program should be a stepping stone toward a baccalaureate degree, and that a large percentage of the courses should be transfer courses. Of course, the technical or career program is designed to be terminal and it is only the exceptional student who will continue.

Our Clinical Laboratory Technician program is something of a pilot program. The existing programs are one year or four years. We have been advised that there is a definite need for the two-year (intermediate technician). Although there is no official classification for the two-year graduate, we are advised that a new category is in the process of development, probably a C L T.

The first year of Clinical Lab is strictly academic--biology, chemistry, microbiology, anatomy and physiology, etc. I'm not so sure that more interest might be maintained if the students had some exposure to the hospital the first year.

The second year is entirely technical, with bacteriology, serology, hematology, electrocardiography, basal metabolism, routine analysis, clinical chemistry and the like--plus a minimum of 16 hours per week in the clinic. All ten of our graduates have been offered positions in the hospitals where they are working.

The lab was designed specifically for Clinical Laboratory, but with the flexibility of serving as a biology lab to ensure full usage. The equipment cost was about \$25,000.

Our Dental Programs are both very popular and productive. We have two dental programs; a one-year dental assisting program, and a two-year dental hygiene program. Some thought is being given to dental technician and a third higher category of "dental nurse."

The equipment is outstanding--cost about \$100,000--a fully-equipped dental lab; a 20-chair clinic; x-ray rooms; dark rooms; locker room; reception room; dental education room and operator. I will show you pictures of some of the equipment. If you are interested in dental hygiene, it would be worth your while to go over and see this setup.

Patients come in from the community, 10:00 - 1:00. We have special contracts with "Job Corps."

We use the 12 o'clock position (sit down dentistry), with patient's head in hygienist's lap--this permits better visualization, and patient can observe in a hand mirror.

Radiologic Technology also is something of an innovation as offered by the Forest Park Community College. The usual procedure is to present the academic and theory followed by the practicum.

The two are concurrent in our program. The student is in the hospital even during the first semester. This is made possible by having the x-ray equipment for training at the College. The equipment consists of a 90° tilt table, and the overhead x-ray mounted on a track. The equipment, dials, controls, etc., are fully operable except that the x-ray tube is not "live." Cost of the equipment was about \$15,000.

Each student in x-ray must have 2400 hours of practicum, in addition to his 64 hours of didactic. The program is very popular in the hospitals. We have more requests for students than we can provide. Although they receive their clinical experience and training in the hospital, the student is still nominally under the supervision of the College teacher of Radiological Technology. Although the hospitals have provided instruction without charge for the first two years of the program, it has been agreed that the College will pay them \$0.46 per contact hour beginning the third year.

Students should not be paid for the time spent in hospitals for which they are receiving credit, but if they are employed at other times and paid it is important that all affiliated hospitals pay equal hourly wages.

Food Service Supervision is a new curriculum with us. We have seven students in our first class. Food Service is an outgrowth of Hotel, Motel and Restaurant Management, which has been a very successful program for several years. The combined program is now called "Hotel, Restaurant, and Institutional Food Service."

The programs are the same for the first year, but at the start of the second year the student is given an option of going into Hotel and Restaurant Management or into Institutional Food Service. Food Service Supervision would involve all large institutions but would specifically relate to hospitals and similar agencies.

Our Medical Office Assistant program operates out of the Business Division due to the heavy emphasis upon typing, clerical, and office procedures, but the students receive some instruction in the Life Science Division in Medical Terminology and Topographic Anatomy. This is a one-year certificate program and qualifies the student to work in the doctor's office.

Nursing is still the most popular of the allied medical technologies. We admitted 102 students into our freshman class this year. We have 51 sophomores who will complete the two-year program in June and will receive their Associate Degree in Applied Science and be eligible to take their State Board examinations for the R.N.

At present we are offering our Maternal and Child Nursing during the summer between the first and second years of the program. This is due primarily to the shortage of obstetric and pediatric clinical facilities during the school year. We are attempting to move to a straight four-semester program.

Of course, the A.D. program in nursing is designed to train nurses to give bedside care. There is always the problem of educating the hospitals to this fact because they are in such need of nurses that they immediately attempt to place the A.D. graduate in a "charge" position. The two-year graduate should have additional in-service training provided by the hospital if they are to be given administrative assignments.

The nursing laboratory was designed especially for this program. The room is a long room with a modern medication and charting station at one end, and a complete hospital room with mechanical beds, electrical beds, bedside tables, toilet, shower, and linen closet at the other end. One hundred and five seats occupy the intermediate area. The room is equipped with screens, projectors, and closed-circuit television.

A new program in inhalation therapy is being planned for the fall in answer to a great demand by the hospitals. There are only about 700 registered inhalation therapists in the United States. There is a demand for about 6000 more. Beginning in 1970, registered therapists must have an associate degree so that it becomes mandatory for the hospital to affiliate with a junior college. The academic courses will be offered at the College, while the clinical courses will be offered in the hospital by doctors and therapists who will be part-time faculty members of the Junior College.

Technical programs are expensive. Our credit hour cost for nursing is \$51, dental hygiene is \$43, while x-ray and clinical lab run about \$32. This is compared with \$16 per credit hour for the liberal arts student. We are constantly working to reduce these costs. Of course, remember that financial assistance is available to these technical curricula in the Vocational Education Act, the Allied Health Act of 1966, and others.

Other curricula have been identified for possible future implementation. Some of these are Chemical Research Laboratory Technology, Hospital Unit Service Manager, Medical Records Technology, Optometric Assistant, Rescue Technician, and others.

LAW ENFORCEMENT (POLICE SCIENCE)

The Ohio Board of Regents and the Ohio Department of Education envision the following to be the role of technical education in the State of Ohio.

Technical education is a post-high school program planned to prepare high school graduates for entrance into para-professional occupations as support personnel for professional practitioners. Such occupations are concerned with design, development, testing, consulting and supervision. Technical education, in comparison to vocational education, gives the major program emphasis to the acquisition of scientific and technical knowledge with work skills as a corollary. Persons are prepared for entrance into employment as technicians through two-year post-high school technical programs in one of three types of institutions--the community college, the technical institute, or the university branch. While certain areas of instruction in technical education may be transferable to a baccalaureate program in a university or college, the program organization and content of the technical program must remain true to its unique goal and function. The academic community, which tends to grant status only to baccalaureate and graduate programs, must not allow the technical education programs to develop into poor quality, indifferently operated activities. The successful completion of the technical education program results in the award of the associate degree. The organization and operation to technical education recognized by the associate degree is the responsibility of the Ohio Board of Regents, with cooperation and assistance from the Division of Vocational Education, State Department of Education.

Law enforcement itself can have many meanings. We could be talking about supervisory or administrative education. We could be talking about basic police education and we could be talking about technical education. I prefer to consider law enforcement today along the lines of technical education or police science.

We started exploratory meetings in law enforcement in 1965 at Penta-Technical Institute which is located near Perrysburg, Ohio or directly south of Toledo. These meetings involved advisory committees of police and educators. We explored the supervision-administration curricula as established in other states, and if you have examined many of these curricula, you would see the similarity in almost all of them.

There were three approaches which could be taken. The first would be the academic and there probably is no need to define this here. The second is vocational and this would be more concerned with basic police training. The third would be a combination of these with an emphasis on vocational and technical.

It was felt by those working on the problem that there were already sufficient law enforcement programs which were slanted toward administration. It was hoped that any new technical program could be very realistic and be of

Presentation by Dr. W. E. Bauer, Law Enforcement Training Consultant, Ohio Department of Education.

real help to police officers and those engaged in police work. Several possibilities for technicians were established and the one which the committee felt could be of real service to all departments was a physical evidence technician. Before establishing any kind of curriculum, it was necessary to make a job analysis of the duties of a physical evidence technician. He would be paraprofessional competently trained in sciences and police work. This would more adequately meet the law enforcement needs by attracting police officers into a program which would be of interest and help to them. It would be more practical based on the fact that less than 40% of B & E's are ever solved. With crime being increased at the rate of one billion dollars a year, this becomes extremely important. The opportunity to learn scientific investigation techniques was never presented in other than a short course basis in the past. The total number of criminalists or criminalisticians on the job has been insufficient and these people are usually working for the FBI or crime laboratories and not immediately available to local police departments and sheriffs' departments. The use of scientific methods and tools must be taught and implemented.

To implement this new curriculum, a committee of police and educators was formed. The first thing they did was to make an analysis of an evidence-technician job. From this the curriculum was developed and finished in February 1968. This was not an easy job and many head-knocking sessions took place. There was much more technical information that could have been included than there was time to include since the total program was to be two years in length. The promotion of the program began in March of this year for September enrollment and the recruitment took place in high schools, police and sheriffs' departments and through news media. The program began in September 1968 with an initial enrollment of 70 students.

There have been many meetings since this began and some of the early ones were minor modifications of the curriculum. There were a couple of course sequence changes deemed necessary and these were actually instituted before the program began. Since going into operation there have been some instructor meetings so that practical planning for lessons oriented to police work could be implemented. There was another technical institute in Ohio which opened a police science program in the fall of 1968 which had a curriculum very close to this one at Penta but perhaps oriented a little more toward the administrative aspect.

During the year we have been meeting with police advisory committees at four other technical institutes which will open programs similar to this one and strongly oriented toward police science. There are some other two-year law enforcement programs which will probably open in Ohio but at the present time we are not certain whether they will be administratively oriented or toward police science.

We did identify other technician possibilities. There may be many others but at least these four can be justified.

1. Record technician - data processing.
2. Accident investigator technician.
3. Polygraph technician.
4. Traffic technician.

In summary, training opportunities must be provided in order to get high school graduates into police work and upgrade in-service offices. We know that many young people while in high school are interested in law enforcement, but in the three years after high school, before they could actually be employed, we lose many of them when they start in other positions, jobs, etc.

The use of the sciences in police work must be emphasized so that more effective case preparation can be accomplished thereby expediting our system of JURIS-PRUDENCE.

RECENT DEVELOPMENTS IN AVIATION TECHNOLOGY EDUCATION

Dr. Carl Barber indicated in his introduction that the aviation industry was one of the largest employers in the U. S. today. I would like to underline that statement by indicating the number of jobs involved--2 to 2-1/2 million. If we were to consult the Dictionary of Occupational Titles, we might find that there are close to 500 occupations encompassed in aviation. For a good overview of aviation jobs, I believe you will find useful the counselor's guide "Aviation - Where Career Opportunities are Bright." This guide was prepared by the National Aerospace Education Council in cooperation with the U. S. Department of Education and the FAA. This organization, NAEC, by the way, is having its annual conference here in St. Louis, April 24-26 at the Gateway Hotel.

Dr. Barber also indicated that as aviation is a new and emerging technology, only sporadic efforts have been made by the education community to meet its training needs. This is not quite true. For many years the FAA has had a small staff of aviation education specialists whose function has been primarily to work with the nation's education system as a means for fostering and promoting civil aviation. This, by the way, is a primary mission of the FAA charged to us by the Congress in the FAA Act of 1958. If you need information or guidance about the development of aviation education programs--kindergarten through graduate school--I recommend that you get in touch with Dr. Merv Strickler or Bob O'Neil who will be able to provide aviation education services. These have been of considerable help to educational institutions throughout the country.

My remarks today are directed to a particular activity our agency has recently initiated--attempting to work more closely and systematically with the nation's education system, particularly at the two-year, post-high school level, as a resource for meeting our long-range manpower and training needs. This effort involves working cooperatively with the aviation industry and the broader aviation community to determine more precisely their and our common educational needs and communicate those needs to the educators.

Before I go on with my remarks, I need to share an experience I had last night in this beautiful city of St. Louis. I have been here a number of times previously but only for a flight layover or to change planes. I have never been able to get acquainted with the city. The Gateway Arch has always interested me and so after the close of yesterday's sessions, I was determined to see it. I left the hotel at about 6 o'clock and stopped the first person I saw and asked, "Which way to the Arch?"

"You can't walk there from here," he said. This made me mad. I asked for information and he told me what I can't do. Nevertheless, I insisted, "But which way to the Arch?"

Very reluctantly he pointed, "It's that way, but I am telling you, you can't walk there from here!"

Presentation by Dr. Lawrence M. Bott, Chief of Education Training Methods and Technique Analysis, F.A.A.

So I walked and walked and walked. I stopped at one point to check my bearings by visiting a bar and having a beer which made St. Louis famous. I asked the man who sat at the bar next to me, "Am I going in the right direction for the Arch?"

"Which way is your car headed?" he asked.

"I am not driving a car," I told him.

"But you can't walk there from here."

The moral to the story is that when people ask for information and all they receive is advice--people telling them what they can or cannot do--it doesn't set well with them. I think that we need to heed this message more. So my role here today is to give information, not to tell you what to do. Moreover, in the development in the aviation technology curricula you may need further information from time to time. We will try to give it to you but we won't try to tell you what you should or should not do with it.

By the way, I did finally reach the Arch. It was magnificent. I urge anyone who hasn't seen it to walk under it and look up.

Last week I visited the corporate headquarters of a large airline. Some of its manpower people and I were talking about aviation technology education. Later we had lunch at the airline's terminal building at JFK Airport. You know that each major airline there has a terminal building as big or almost as big as the beautiful St. Louis terminal. This particular one was an ultimate one in modern construction. For example, it had a doorway of air whereby one could walk from the cold exterior into the warm terminal area without the benefit of a door. A stream of air separates the outside from the inside. While sitting at the upstairs dining area which overlooks the entire terminal operations, the airline people and I reminisced. They told me that less than 20 years ago they operated from that same spot out of a small circus tent. We talked about the Boeing Stratocruiser days--just 11 or 12 years ago--in which one could have a leisurely drink on the upper deck and then retire to his berth during a flight from Honolulu to Los Angeles.

This brought up the question of the 747's--you know, the stretched aircraft which will carry 400 and more passengers. "Will you be ready for them?" I asked. They answered, "Sure we will. We have already enlarged this terminal building by one-third." We noted the gash in the ceiling of this round terminal building which indicated the point at which the new extension started. My point is that certainly this company, one of the world's most experienced airlines, a company with great sophistication, long in the aviation business, certainly should have predicted the growth of aviation and the requirements for this terminal facility. But they hadn't. Most of us in the aviation business have undershot the target considerably. What all of this adds up to is the recognition of the explosive growth of aviation and how difficult it is to keep up with it.

In this talk this morning, I would like to discuss three things. First, the nature of this explosive growth--the aviation technology picture. Secondly, I would like to discuss the problems those in aviation have had in obtaining

and maintaining people with the kinds of aviation technology skills and knowledge that are needed. And finally, I would like to review for you the actions that are being taken in working more consciously and systematically with the educational community in helping it meet aviation's manpower needs.

First, let's look at the aviation technology picture. Where are the 2 to 2-1/2 million jobs? We are talking about the various components of air transportation--commercial activities, passenger and freight; the business executive flying from Dallas to New York; industrial uses - crop dusting, helicopters installing and monitoring power lines; and the family on a pleasure jaunt - the Sunday flyer in a small, single engine, four-seater airplane.

We are talking about four things. First, aircraft--manufacturing, maintaining and manning them. Secondly, airports--building, maintaining, managing, and operating them. Third, air routes and the use of air space--the many electronic and other aids to air navigation, air traffic control of the terminal areas space and of the highways in the sky between terminals, plus flight assistance of various kinds to those who fly. Fourth, support activities at airports both commercial and private--food, baggage, fuel, etc.

Now, that is what it is. Next, where is aviation technology and where is it going? This is certainly related to the conference theme, "Technical Education for the 70's." Let me give you some statistics, first on aircraft. We now have about 2,500 carriers--essentially the airlines' planes. By the end of the 70's we expect to have about 3,600 carriers, over 100 of which are expected to be Supersonic Transports. Also, many will be vertical takeoff and landing aircraft as well as the large stretched subsonic carriers.

General aviation aircraft, that is all other aircraft except the carriers, now number around 114,000. By 1980 we expect to have about 100,000 more. At the present time the nation is manufacturing about 21,000 aircraft engines per year. By 1980 this figure will reach about 45,000 per year.

Airports--we now have over 3,200 publicly owned airports. Long-range airport planning calls for expanding or improving about 2,700 of these and about 800 new ones are needed.

Air routes and operations--the carriers are now flying over 1 billion passenger revenue miles a year. By the end of the next decade, we expect them to fly over 4 billion passenger revenue miles. General aviation aircraft are currently flying more than 23 million hours in the air each year. By 1980 they will be using the air space at the rate of 43 million hours per year. In 1968 there were 53 million takeoffs and landings under FAA control. By 1980 that figure will reach 172 million. Flight assistance services were about 62 million in 1968. By 1980 we expect to provide four times that number of services.

The demand for aviation--people flying in commercial airliners provide the most striking demonstration of aviation growth. In 1964 about 74 million passengers flew in the U. S. Four years later that number was close to 140 million, almost double. By 1980 that figure is expected to be close to 500 million passengers per year. The world statistics are equally as compelling. The 236 million passengers in 1968 will swell to 770 million by the end of the 70's.

All of this means a great expansion in the number of aviation jobs and an increase in the variety of them. The trend is toward more complex jobs with a more rapid rate of change in the nature of the jobs. Two factors will determine whether aviation will continue to grow at this phenomenal rate. The first has to do with the willingness to spend the money it will take to increase the services--particularly in the terminal areas required by this expansion. The second has to do with manpower. The realization of the enormous potential of aviation is possible only if we have the skilled manpower we need when and where we need it.

Now having given a picture of aviation technology, let me move on to the second point in my remarks--some problems in obtaining and maintaining the skilled manpower required. Again, I don't want to imply that aviation technology training is a new field. For example, more than 100 institutions are certified by the FAA to conduct air frame and power plant (A&P) training for aviation mechanics. There must be another 50 to 75 post-high school institutions which have other aviation technology programs of various kinds, flight training programs, airport management, etc. If it is true that the aviation/aerospace and related industry is the second largest employer in the U. S. today it is only logical that aviation technology education programs would be expanding rapidly. And they are. Schools and colleges which see their role as helping to train people for employment naturally are seeking to develop, expand, and strengthen aviation technology education programs.

We have had some concern that in increasing the number and variety of these programs the educational institutions do their homework. By this I mean that they determine, with reasonable accuracy, that the programs that they develop and conduct do, in fact, help qualify people for the jobs for which the programs are established. I am concerned, for example, about programs which are advertised to prepare people for airline pilot jobs. The airlines people I have talked to point out that they require a minimum of 2000 hours on multiengine aircraft for employment as pilots. Most schools lack the ability to provide the 2000 hours of flight training. Similarly, we have learned of some schools which are developing programs advertised to prepare people for the job of air traffic controller. Many schools lack the capability to provide the aviation experience required to qualify personnel for air traffic controllers under the current Civil Service Commission standards and hiring practices. Because of the high cost of educational development, we are also very concerned about false starts, misdirected efforts, duplication of effort and the continuous need for insuring a reasonable balance between supply and demand. We are concerned about what happens when "too many" schools initiate programs to train people for specific occupations and find that their graduates cannot obtain employment in the specific jobs for which they were trained. For these reasons we are trying to work very systematically and carefully to obtain the information needed by the educational system to effectively plan for the development, expansion, and strengthening of aviation technology education programs. In this process we have uncovered three dilemmas.

We were discussing the problem of obtaining and maintaining skilled aviation manpower with an official of a major aircraft manufacturer. He said that it is just impossible to predict manpower needs even six months ahead. It's the nature of the aviation business, he said. Not only do fantastically rapid technological changes affect the manpower picture, but the company must con-

stantly consider extremely sensitive and fluctuating economic, political and even social factors. This spokesman went on to say, however, that they were in great fear of a spectre, always on the horizon. The spectre they feared was to be confronted with the need to undertake a major new manufacturing operation--or assume a new government contract and find they are without the manpower required to do the job.

So, this official provided us with the two horns of the first dilemma. One horn--it is impossible to predict aviation manpower needs. The other horn--we can't afford not to predict these needs.

Here is another dilemma. The highly complex nature of today's aviation technology occupations frequently requires highly specialized and comprehensive technical training. Ideally, we would like, and I believe the industry would like, to hire people who have the specialized training they need to be fully productive as they step into their jobs.

The other horn of this dilemma is that if we ask colleges to train the student for immediate, full productivity he may have obsolete skills and knowledge when he seeks employment. The job he was trained to perform may no longer exist, at least in the way he was trained for it. Technological advances might be such that the equipment and facilities he was trained on or the operation for which he was trained to be a part of has significantly changed. Recently, the manpower research director of a large aircraft corporation told us that they worked with a local junior college to develop a computer technology course. The college dutifully examined the equipment being used by the corporation and built into their course the development of skills and knowledge needed for that computer. Six months later, the college was ready to conduct their program and took their proposed course back to the industry for final approval. The industry representative had to point out that the equipment on which training was proposed was already obsolete. The training program was out-of-date and useless even before the first student entered it.

Another aspect of this dilemma results when the colleges which are doing the training are not on the same wavelength with potential employers. I have a concern in this connection with aviation technology education. Many colleges--perhaps 60 or so--have written to us within the last few months to tell us of their plans to enlarge aviation technology education and training programs. We suspect there may be many other such colleges doing the same and we haven't heard about it.

Quite a number of the colleges which are writing to us seek guidance in developing programs to train air traffic controllers for us. We are delighted with this interest, but we are cautioning the colleges that, in their enthusiasm to be responsive to the FAA's need and that of the aviation industry, they do not develop programs to train students for today's jobs rather than tomorrow's.

While I am at it, I would like to speak about the widespread misinformation on the shortage of air traffic controllers. It is true that the agency needs many more air traffic controllers and that we are apt to need to recruit anywhere from 2000 to 3000 or more controllers a year for at least the next

ten years. But, at the present time we do not have a problem recruiting qualified people nor do we have a problem of training them. However, we are looking for different approaches to recruiting and training. It is in this connection that we are looking to the colleges. One current action which I will speak about a little later is experimenting with the colleges on developing a reservoir of attractive candidates for air traffic control and other FAA work. Such a reservoir might some day supplement or even replace our current reservoir--largely fed by the military.

One more dilemma. The highly complex nature of aviation technology is requiring more and more training for adequate performance. The other horn of this dilemma is that we must take time from that tight technical training schedule to provide the potential aviation employee with a broad, general educational base. If we are going to have a society in which men and women in technical jobs are more than robots and a society in which mankind is the master of technology and not its slave, we must insure that the technician has a broad understanding of the sociology, economics, psychology, history, philosophy, and especially the ecology of the world of which he is a part.

In short, we must provide the technician with means to look at our value structure not just the structure of the technological machine he operates. It is a sobering idea that through our society's preoccupation with technology without regard to its effect on our value structure we are creating a monster which can reduce mankind to an unthinking organism. This idea is developed in an article in the August 26, 1968 issue of the magazine, The Nation. In the article called "Backlash of Technology - Where Power Belongs," Mr. Anthony Wedgwood Benn, Minister of Technology in Great Britain's Labour government, said the following:

"Just as technology is revolutionizing industry, so it is outdating our political institutions as well. Our educational system, our system of local government, the civil service, and the legal system are all now under critical examination because technology has made them obsolete."

One of Mr. Benn's points is that in our use of technology we have overlooked its effect on the individual and his deep striving to be a more authentic, unique human being. Because of this effect, the individual is fighting back. And society is misinterpreting this rebellion.

Mr. Benn sums up his discussion on this subject by saying that pressures for change resulting from the impact of technology on our society are inevitable. And unless we respond positively and creatively to these pressures, "discontent, expressing itself in despairing apathy or violent protest, could engulf us all."

I believe that colleges which are helping develop people for aviation technology jobs must provide them not only with the technical skills and knowledge they need but with the insights into the world around them which they also need. Rather than being engulfed in this discontent, our technicians must be equipped to help direct the pressures for change.

The third and final part of my remarks has to do with the actions underway in working with the educational community as a resource to help aviation

meet its long-range manpower and training needs. There are two schools of thought on this matter. The first is a kind of laissez-faire attitude which holds that we should not interfere with the planning or direction of educational curricula--that somehow the system will produce what we need even though by trial and error. The other school of thought is the other extreme. It calls for a kind of total planning. For example, I understand that the British, in their concern to insure that aviation has the skilled manpower needed for the continued growth of aviation, levies a tax on employers for each employee engaged in the aviation industry. The purpose of this tax is to provide appropriate education and training programs, which are directed by the Civil Air Transport Training Board. We seek a middle ground between these two positions.

Let me speak briefly about four specific actions. First, we are making a concerted effort to determine and articulate the educational requirements of FAA jobs. As this is a long-range effort, we are asking key individuals in the agency to project the kind of industry and society we will have in the 70's and 80's, to visualize the kind of aviation agency that will be needed to serve that industry and society, to identify the kinds of jobs needed by that agency, and then to determine the educational requirements for those jobs.

A second action. We are going to key representatives of the aviation industry and broader aviation community to capitalize on their experience in projecting their long-range education and training needs and then to cooperatively communicate our common needs to the educational system.

A third related action is being conducted by UCLA in cooperation with the California State Department of Education. This action involves analyzing a group of aviation occupations which require employees to function in a rapidly-changing, computer-oriented air transportation environment. One of these occupations is air traffic control. A part of the California study includes developing curricula to train personnel for these occupations and, most important as far as you are concerned, to determine the role of colleges in providing that training.

The fourth action is a project through which the FAA is initiating a series of experimental aviation technology educational programs in a number of junior colleges and technical institutes throughout the country. The primary purpose of these experimental programs is to obtain data on which to base decisions on changing our recruitment, training, and employee utilization patterns. Each experiment will have somewhat different objectives, curriculum and educational approach. It is through this experimental project that we hope to obtain data which might justify or support recruiting a larger number of FAA employees--particularly for the Air Traffic Service from among junior college graduates. The design of these experimental programs is being planned in cooperation with representatives of the aviation industry. Hopefully, the programs will be sufficiently broad to enable graduates to obtain employment not only within the FAA but in industry and in the broader aviation community. The results of each of these four actions will be systematically communicated to the educational community, for example through the American Association of Junior Colleges.

In summary, the main message I would like to leave with you is that we in the FAA and also, I believe, in industry see great possibilities in working more

closely and systematically with the nation's education system to develop a planned reservoir of people for aviation jobs. In particular, we see a great need for articulating aviation's needs in the "middle manpower level" which Marvin Feldman of the Ford Foundation spoke about yesterday. And we seek to work, at first experimentally, with the institutions which have two-year post-high school programs as one source for meeting these needs. In short, the FAA seeks to promote three groups working cooperatively to further their common interests in one area of the whole spectrum of aviation technology education. These groups are the aviation industry, the broader aviation community; the government; and the educational institutions. I don't want to leave you with the impression that there is a vast, organized and funded federal program to do this. As far as the FAA is concerned, this particular project is largely a one-man operation and I'm that man.

The actions we are taking are along cooperative, mutual interest lines and are certainly not regulatory or directive in nature. And these actions are tentative and experimental. We welcome your suggestions and comments.

SUMMARY COMMENTS OF DISCUSSION GROUP

on RESEARCH

Discussion Leader: Robert Gray for Verne E. Burgener

Recorder: Joseph Gutenson for Harmon D. Roberts

The major concern of the group was how can research monies be utilized for the greatest impact on technical education. Some of the specific recommendations that were made are as follows:

1. Each state should provide a valid review system for proposals which are submitted. This should include representatives from technical education.
2. The state advisory committee should develop priorities and give direction to those people involved in research and development activities. Representatives from technical education should be included as members of the state advisory committees.
3. Emphasis should be placed on development of competencies of individuals for conducting and administering research activities.
4. Research monies might be especially helpful to technical education if utilized in the area of "pre-technical" education.
5. The limited amount of data for planning and evaluation of technical education demands that research monies be used for follow-up studies and collection of other data specifically related to technical education.
6. A major concern was expressed for increased emphasis on teacher education in technical education.

Throughout the discussion the theme of the need for more applied research, as it relates to the developmental phase of exemplary programs, was stressed. Basic research has been critized, and sometimes justifiably so, for not addressing itself to the relevant problems that exist in technical education. The people in technical education feel that action research should be the main objective and that the definition of research, as such, should have a broad connotation so that it would be able to provide some of the many needed answers to problems facing technical educators today.

The new guidelines should provide monies that will be available for conducting manpower need studies for technicians, developing curriculums for new and emerging technologies, conducting new innovative teacher education programs, conducting in-service training programs to develop competent researchers in the field of technical education, and the use of the research coordinating units as a vehicle for coordinating workshop activities in the various related areas.

SUMMARY COMMENTS OF DISCUSSION GROUP
on
RESIDENTIAL FACILITIES

Discussion Leader: Arnold H. Potthast

Recorder: Jacob See

The group meeting to discuss the residential facilities felt the following items as top priority considerations in developing the guidelines.

1. In the planning of residential facilities there should be a division in the age groups into the fourteen to seventeen category and the seventeen through twenty-one group. Consideration should be given to the establishment of separate facilities for each group. The age group of seventeen to twenty-one at the post-secondary level should be given priority with the possibility of recognizing another group in the age bracket of twenty-one to twenty-five.
2. The residential facilities should be a separate facility devoted to an integrated program of vocational and technical education. The act should not specify the types of programs to be offered in the residential facility. There should be a broad interpretation to provide the necessary flexibility of meeting the needs of the students in the residential facility.
3. The residential vocational-technical school is an appropriate institution for bringing vocational and technical education opportunity to those who are in need of training and education. The students of the residential facility should be oriented toward vocational and technical education and should be separate from the community or junior college.
4. The residential vocational-technical school should serve students from all social economic levels and should continue on that basis.
5. Every effort should be extended in the attempts to have the residential facility phase of the act funded at least for a pilot school.

One of the concerns that seemed to arise throughout the discussion was the fact that some of the administrators in the states do not have a full appreciation of the role of post-high school technical education as it would relate in the concept of the residential vocational-technical schools. The guidelines should be so written as to enable the development of these residential facilities to meet the specific needs of the people in the area where the facilities will be constructed rather than to have the funds to be used for "business as usual," as might be the case under some of the narrowly defined state plans.

SUMMARY COMMENTS OF DISCUSSION GROUP

on

COOPERATIVE PROGRAMS

Discussion Leader: Carl S. Barber

Recorder: Walter E. Weffenstette

The discussion group considered how cooperative education can best enhance technical education. There were three concerns expressed as to how cooperative programs relate to the institution, the employer, and the student.

The Institution

The guidelines should be so written to permit the school participating in cooperative education to upgrade its facilities, purchase new equipment to update with current industrial practices, upgrade personnel, and to utilize some of the equipment in the actual employment environment. The need for the semi-professional technical levels of technicians requires a large amount of expensive laboratory equipment. The facilities in the institution must closely correlate the experience the student will be obtaining in industry.

The Employer

The guidelines should be written in such a manner as to enable the employer to involve a large number of students. Compensation should be provided the students from the funds of the act so as to enable the employer to involve the students in meaningful experiences that are not usually available, at the present time, due to the various local conditions. In many cases the employer may have a well-established training program and, in some cases, can be utilized on a contractual basis to provide specific parts of the training and education requirement for the technical education aspect of the curriculum for the student.

The Student

The state plans should enable the student participating in the cooperative program to begin at the seventh and eighth grade level. The possibility of providing counseling services by the employer, while the student is in the employment situation, would make a more meaningful experience for the student. The program should normally be twelve months in length. In a technical education program, normally the two-year associate degree should be obtained in three years to enable the cooperative student to obtain both the industrial experience and the academic background.

Cooperative education programs should be widely available to the disadvantaged groups since the involvement in a world of work will assist in the development of proper work habits and social skills as well as providing motivation for the disadvantaged student to learn to participate in the society that surrounds him.

Other Considerations

Money should be made available to train coordinators who will have a wide base to operate from. The coordinator should expand his capabilities and involvements to include the ability to assess the individual student's capabilities and provide them with some counseling service and motivating direction.

Cooperative education should be made available for the teachers so they can keep up with the developments in their particular field of teaching. In addition to this, they should be involved in the development of new and emerging technologies. In future decades there will be many new emerging technologies that will require technicians. The teachers must upgrade and retrain themselves to be able to teach in programs preparing technicians for these new emerging technologies.

SUMMARY COMMENTS OF DISCUSSION GROUP
on
CURRICULUM DEVELOPMENT

Discussion Leader: Maurice W. Roney

Recorder: Marvin Hill

The discussion group on curriculum development was by far the largest of the four. There was more interest expressed by the participants in attendance at the conference in this topic than in any of the others. The session was opened by a restatement of the seven points outlined by Melvin Barlow which are as follows:

1. Percent of general education in vocational-technical education programs,
2. Where should major emphasis be placed--on materials for teachers or materials for students,
3. Content with respect to technical education programs,
4. Dissemination of materials,
5. Emphasis on production of materials,
6. Regional curriculum centers,
7. The large amount of curriculum materials available.

From this as a basis the discussion group addressed itself to the points listed below:

General Education Requirements

1. Concern was expressed over the narrow viewpoint in general education toward courses designed for meeting the objectives of technical education and not necessarily transferable to a bachelor of science degree.
2. Redefinition of general education suggested: More baccalaureate programs available into which the two-year person may transfer. It was also the opinion that some universities and colleges were changing their attitude toward technical education and more baccalaureate programs are being provided for the two-year transfer.
3. There is danger in changing general education requirements for the ten percent of students who transfer into baccalaureate programs if an attempt is made to broaden general education requirements.
4. Objectives of curriculum should be analyzed and then establish general education courses.

5. General education people working on requirements as well as vocational-technical people: What safeguards do we need to eliminate over duplication of materials?
6. There was an indication of reluctance to look elsewhere for information. There are guidelines available.
7. Why not put general education in second year. Students drop out for lack of interest in programs when too many general education courses are offered during the first year.
8. There is a need to redefine technical education as it meets the needs of technical students and suggest to the accrediting groups that they broaden their concepts of general education.
9. The first two years of the technical programs that meet some transfer requirements should be modified, and the universities and colleges should be providing two years beyond the two-year technical program for those students who are interested in a baccalaureate degree.
10. It was suggested that a reevaluation of general education requirements be made for technical programs and these recommendations sent to the accrediting agencies.
11. There is a need to identify talent in the learning style of the individual that will reflect the differences between the people who learn in the traditional kind of general education programs and the people who learn best under the situation where they are able to work with things and materials. To try to put them both in the same general education program has failed for years. Different talents and learning styles should be recognized.
12. General education cannot be defined by courses: Very difficult to define.

Items 2, 8, and 11 above were identified by the group as perhaps the most important in terms of implementing technical education under this part of the act.

How to Spend \$2,000,000 Next Year For Instructional Materials Development and Curriculum Development

1. Is it more important to concentrate on materials for teachers or materials for students? Can they be separated?
2. Concentrate on areas where we have the least amount of materials and the greater needs.
3. Should not spend money for duplication.
4. Suggestion was made that it was necessary to train the technical specialist or instructor teaching the students how to put the proper behavioral objectives in the right pattern and establish the objec-

tives in light of the program which is developed for his community, and then let him assume the responsibility for doing the curriculum development at the local level. This would take time and time is important.

5. Suggested that money spent be concentrated on a few areas in order to get curriculum guides and instructional materials out in the least amount of time and avoid duplication. This should be done by technologies. Who determines what is good and what is bad?
6. It was suggested that some of the money could well be spent in updating good vocational counseling. Upgrade people in the field and see that new personnel have a good background in industrial contacts for counseling; counselors should know the difference in curricula.
7. Regional facility was suggested to disseminate materials. Not many states have curriculum laboratories.
8. Suggestion was made that a committee should be put together, one interested in how to spend \$2,000,000 for curriculum development and instructional materials development.
9. A suggestion was made that we start with the curriculum and develop all the materials we have planned, making use of the combined efforts of our instructors. This material should then be sent to the state advisory committee. When unanimous acceptance of this material has been given by all concerned, then it should be forwarded to the junior colleges.
10. A nationwide approach in developing materials on many of our curricula instead of state level was suggested. This would eliminate duplication and effort of state and local groups. Spend money on the national level and select programs on a priority basis.
11. After considerable discussion on the availability of materials already developed, a motion was made and seconded that this group recommend that the \$2,000,000 be spent to get this material into the hands of the schools. Motion carried.

Items 8, 10, and 11 were deemed to be the most salient points that were brought up by the discussion group.

THE IMPACT OF NEW LEGISLATION ON TECHNICAL EDUCATION

The Vocational Education Amendments of 1968, when funded by Congress, will represent the largest thrust for change in the history of American education. Unfortunately, most of the thrust of this bill is hidden, and few educators understand the total impact of the program. Indeed, one almost needs to be involved in the administration of vocational-technical education at the federal level to understand fully this impact.

The 1968 Amendments replace most of the existing legislation in the field of vocational education. The Smith-Hughes Act of 1917 is the only remnant, saved for its historic value. It exists now only as a continuing appropriation of \$7.2 million to be used for the purposes of the 1968 Amendments.

Why is this such a big bill? It is big because of what it promises. The accomplishments of this bill cannot yet be examined concretely because Congress has yet to appropriate dollars. Many persons believe that a whole new program is now being implemented because Congress has passed legislation. Nothing could be farther from the truth. The Vocational Education Amendments of 1968 have yet to receive their first funding. This first funding is very important, because without it vocational educators cannot undertake the new responsibilities Congress has given them.

What about the monetary size of the bill? Most of the money goes to the states to carry out programs outlined in their state plans. When the bill came out in its first tentative form, it proposed a federal expenditure of approximately \$1.25 billion. However, Congress, at that time, had to cut from \$6 to \$8 billion from the budget. Congress was faced with a conflict of interests: it couldn't cut money out of a budget while adding vast new sums for vocational education. Therefore, Congress reduced some four-year programs to two years, but retained the original per year authorized funding.

Thus, when the Office of Education plots the expenditure pattern, the total projected funding comes to approximately \$900 million. However, if the funding for two-year programs is extended to four years, the total projection comes to approximately \$1.25 billion. In addition, the states and local districts must provide a 50 percent matching for most of these federal funds. Of course, the matching ratios are variable: some parts of the Amendments allow 100 percent federal funding. One or two parts require 80 or 90 percent. Most of the programs, however, require 50-50 matching. One hundred twenty-five billion dollars matched by the states and local districts would produce \$2.5 billion for vocational education programs.

However, \$2.5 billion is only half the money involved. Traditionally, there is a pattern of three-to-one overmatching by local districts and states. When the federal government provides one dollar to a local district, the state provides three dollars. In order to arrive at the total dollar impact, the projected \$1.25 billion has to be multiplied by four. This means there could

Presentation by Dr. Leon P. Minear, Director of the Division of Vocational and Technical Education, U. S. Office of Education.

be as much as four to five billions of dollars to be spent on vocational education if the 1968 amendments were fully funded.

Now this will take some time. The members of Congress with whom vocational educators have discussed this bill have indicated that this funding is important to them. The Administration, on the other hand, has had some very serious problems to deal with: inflation, the antiballistic missile, the Vietnam War and the demand of the American people to hold the line on budgets. Funds could be appropriated out of the already overextended budget, however, if the Congress of the United States decides to put its limited resources in vocational education. The members of the Congressional education committees indicate that there is definitely going to be funding of this bill. Some of the members would like to fund it in its entirety, but they are concerned about where the dollars will come from. So the vocational education community will not know until Congress comes to the point of appropriating funds, which may be as late as November, the amount of new money available for programs under this bill.

Why is it important to this country to have vast new resources in vocational education? I think vocational education is woven into the warp and woof of this country to the extent that Congress dare not do something in the field of vocational education.

For example, I would like to sketch briefly the sociological trends I witnessed on the West Coast. A few years ago during the Watts riots, people started burning down the town. On the West Coast this trend moved north into the San Francisco area, the Hunters Point riots, and across the Bay with the Castle Mont High School riots, where for the first time, not only did Negro youths burn and ransack school buildings, but white youngsters did too. In Newark, New Jersey, for the first time there were snipers on the roof tops--middle class whites shooting at anybody or anything just to be doing something. At Sunset and Vine in Hollywood, California, a year or so after the Watts riot, weekend after weekend, middle class white youths would go up and down the busy intersection, turning over cars, slashing tires, breaking windows, just for fun. These incidents pointed out that something was seriously wrong with society, and relevancy in American education was looked to as an antidote.

Relevancy means different things to different people, but one thing is certain: American education can no longer be based on a curriculum that is essentially a replica of the seven liberal arts curriculums used at the University of Paris in the twelfth century. Now the seven liberal arts are fine for those who succeed in that kind of curriculum. But many Americans not only reject the liberal arts approach, they are turned off by it, they are thrown out of schools by it, and they reject the schools because of it. There is a major altercation going on in our society that is barely covered up in many communities.

This new bill provides not only 100 percent money for the disadvantaged, but additional sums at the 50-50 ratio so that there will be more money for vocational education for the disadvantaged than there is now for vocational education in its entirety. This funding presupposes, then, a vast new approach to and some new responsibilities for American education.

These new responsibilities, training not only the high school students, but the dropouts, the disadvantaged and the handicapped, are not going to be easy. In the last several years, I have met with several of the militant minority groups. About a year ago I met with representatives of one of the foundations in Santa Barbara. They had pulled together representatives of militant minority groups. This meeting was fascinating, and a little disturbing, at the time. I recall that the foundation representative said, "Now, look, this is really a meeting for the militant groups, and, Leon, you will be the only educator present, so try not to act like a teacher. We are going to listen; and, to start the ball rolling, we are going to open the conference in the bar of a little hotel, just for a get-acquainted session."

To show the size of the problem, I walked into the bar and there were some fellows in leather jackets, beards, hair combed with an egg beater. I tried to remember what the foundation representative said about getting acquainted. I looked around rather apprehensively and at the bar was one vacant stool. I sat down and introduced myself to the black fellow next to me. He would have made two or three of me, about six foot five, 300 pounds, with a great mass of whiskers. I wasn't quite sure he was going to speak to me. Then, I offered him a drink.

Finally, he said to me in growly-grunty tones, "What's your bag?"

"What's my bag?" I said, "What do you mean, what's my bag?"

"What do you do?" he asked, "What are your tricks?"

"I'm in the school business, I'm a school superintendent," I said.

"Oh," he said and grunted.

At that time, the fellow on the right of me said, "My name's Joe Something-or-other."

I said, "How do you do. I'd like to have you meet this other gentleman. He'll want to know what your bag of tricks is."

"Now, wait a minute," this other great big fellow said, and he grabbed me by the shirt and heisted me up, "I didn't say any such thing."

I said, "What's wrong?"

He said, "I asked you what your bag was, not what your bag of tricks was."

"Is there a difference?" I asked.

I found out there is a difference. A bag of tricks seems to be a dirty word and what's your bag means what is your occupation. The next two days in Santa Barbara were spent trying to communicate with some of these people from the ghetto. I suspect they were making it deliberately hard for the few "whities" who were there to get the point. And the point is, there is not in this country the kind of society that I and many Americans thought there was. The middle class lives in one world and there are others who live in another world. And Congress knows this.

For generations, Congress felt that education was taking care of these two worlds. And, indeed, for many years education was the melting pot and the backbone of this society. Our forefathers came to these shores from many countries. Within one or two generations, our public school system made us a people with a common culture. However, now there are people who have a different culture and who reject the culture in which the majority lives. Congress, with a vast number of hearings, addressed itself to these questions: how to educate young men and women to live in this society; how to teach them what they have to know to be adults. This particular bill provides funds for programs that address themselves to these problems.

There is a new twist in the mechanics of this bill. Since the Smith-Hughes Act of 1917, state plans for the expenditure of federal funds for vocational education have been required. Now, for the first time, local plans are also required. Community colleges, technical institutes and local education districts must provide a five-year projection of expenditures. In effect, the federal government asks what is being done with local dollars and how do the dollars of the federal government fit into the local plan. In other words, districts can no longer have the dollars without planning for their expenditure on a five-year basis. Congress decided this was important because often the federal dollar is added to the local dollar in a hard-pressed budget and becomes sort of a tax offset. The local plans are not submitted to Washington. They only go to the state capital. Then the state formulates its plan for taking care of the occupational needs of young men and women, boys and girls, the disadvantaged and the handicapped.

The community college has a unique role in this new act. Career development, the community college and technical education have a great future together. There is a hope in this country that the community college can address itself to urban problems in the manner that land grant colleges addressed themselves to rural problems a hundred years ago when they were founded. One difficulty is that community college people too frequently want to pull back into their ivory towers--because it is so easy to do. Too frequently, educators begin to be concerned not about the problems, but about their own prestige, and too frequently they attempt to adapt not measures to take care of people, but measures to take care of themselves. Can the education community develop an urban college which will help with the problems of urban America? I think it can and I think that the community college is this instrument.

However, educating the disadvantaged at the post-high school level presents some severe difficulties. Even the physical location of the institution can be a problem. The disadvantaged tend to live in the downtown core area; the new community colleges tend to be in suburbia. The problem is just getting education to the people who need it.

In large metropolitan areas we find the development of downtown ghetto-area community colleges for both vocational education and general education. But these alone are not doing the job. The Education Commission of the States, representing 50 governors, 50 state school superintendents and state board members, formed a task force on vocational-technical education last year. It was my pleasure to chair this group, which tried to address itself to the question of how to change the educational pattern. Certainly the programs operating now are needed. But these programs are somehow not touching all of the people.

The task force reasoned like this: there is a certain group in our society that appears unable to succeed with secondary experiences. In secondary experiences you are talked at, you read about something, you write about something, you sit while things happen to you. In primary experiences you stub your toe, throw something at someone. It's the real world versus the academic world.

If these secondary experiences defeat major segments of our society in our school systems, perhaps primary educational experiences should be developed for young adults, experiences that will at least allow them to learn some of the problems that result from living in society. They should no longer grow in years without some experiences that will be beneficial and educational in nature. The Education Commission thought there were some things which could be taught and communicated through primary experiences: work and responsibility.

For example, Philadelphia has developed a downtown high school without a building. The high school uses a museum, newspaper offices, stores, and shops. These vocational educators used cooperative vocational education techniques extensively. Through a system of primary experiences in a real world, supplemented with book learning, counseling, and teaching, Philadelphia has begun to develop a system that is unique. Educators who work with urban ghetto problems are beginning to look at cooperative education and community colleges as the hope for our country in the years to come.

So one of the big thrusts in the years ahead is going to be cooperative education, and there are sums set aside in the amendments for cooperative education programs. It is impossible to bring shops, labs, and replicas of real life work situations inside the classroom and to build enough labs and shops to teach all of the youth the types of occupational skills they want and need. Our only hope is to form a more inclusive cooperative program between labor, management, industry, business, and the school.

Most of the funds in the amendments will be allotted to the states to help them implement vocational education programs. In addition, Congress has designated certain sums for consumer education, research, and training, to build area vocational and demonstration schools, for work-study programs, curriculum development, and exemplary programs.

Exemplary programs--what are those? It is for educators in the field to decide. What would they do if they had a few dollars to provide better vocational education? Exemplary programs take some of the research from the researcher and put it into practice. I know that educators would come up with some good ideas if they were asked what they would do if they had more money. So this bill provides money directly to the states for programs tailored to alleviate and improve specific area problems.

I know that if vocational educators tackle these new responsibilities set before them by Congress with the same gusto, dedication, and optimism which characterize their present activities, Congress will continue to provide funds to support the vital and necessary service they are performing.

APPENDIX A

AMERICAN TECHNICAL EDUCATION ASSOCIATION

and

U. S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
Office of Education
Bureau of Adult, Vocational, and Library Programs
Division of Vocational and Technical Education
Washington, D. C. 20202

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NATIONAL CLINIC ON TECHNICAL EDUCATION

Chase Park Plaza
St. Louis, Missouri
March 26, 27, 28, 1969

AGENDA

Theme: TECHNICAL EDUCATION FOR THE SEVENTIES

Purposes: 1. Guidelines For Implementing New Legislation
2. Employer-Educator Relationships
3. New Expanding Emerging Technologies

Wednesday, March 26

8:00 a.m. Registration

9:00 a.m. Opening: Chairman, Jerry S. Dobrovolsky, University of Illinois.

- A. Welcome - Alfonso J. Cervantes, Mayor, St. Louis.
 - Beauford W. Robinson, State Director, Vocational Education, Missouri Department of Education.
 - Thaine D. McCormick, Regional Director, AVLPL.
 - Roy W. Dugger, President, ATEA.
- B. Introductions
- C. Clinic Overview and Methods
- D. Announcements

9:45 a.m. Educational Renewal: The Role of Technical Education - Marvin Feldman, Ford Foundation.

10:25 a.m. Communicating With Advisory, Civic, Employer Groups, or Other Persons About Technicians - Walter J. Brooking, Program Specialist, Technical Education, U. S. Office of Education.

10:45 a.m. Break

11:00 a.m. Technical Education in the Junior Colleges - Lewis R. Fibel, Specialist in Occupational Education, American Association of Junior Colleges.

- 11:30 a.m. Technical Education in American Higher Education - Howard F. Foncannon, Coordinator, Technical Education Project, American Association for the Advancement of Science.
- 12:15 p.m. ATEA Business Luncheon - Roy W. Dugger, President, ATEA.
- 1:30 p.m. Reports of National Conferences on Guideline Development.
Chairman: Walter J. Brooking, U. S. Office of Education.
- A. Topic I - Research - William L. Hull, Oklahoma State Technical College.
- 1:50 p.m. B. Topic II - Residential Facilities - Wayne W. Miller, Director and Dean, Oklahoma State Technical College.
- 2:20 p.m. C. Topic III - Cooperative Programs - Elizabeth J. Simpson, University of Illinois.
- 2:50 p.m. D. Topic IV - Curriculum Development - Melvin Barlow, University of California at Los Angeles.
- 3:20 p.m. Break
- 3:40 p.m. Discussion Groups on Guidelines
- A. Topic I - Research
Discussion Leader: Robert Gray, Illinois Board of Vocational Education.
Recorder: Joe Gutenson, Thornton Junior College, Illinois.
- B. Topic II - Residential Facilities
Discussion Leader: Arnold H. Potthast, Wisconsin State Board of Vocational, Technical, and Adult Education.
Recorder: Jacob See, Penta Technical College, Ohio.
- C. Topic III - Cooperative Programs
Discussion Leader: Carl S. Barber, U.S.O.E., Kansas City, Missouri.
Recorder: Walter E. Weffenstette, Indiana State University.
- D. Topic IV - Curriculum Development
Discussion Leader: Maurice W. Roney, Oklahoma State University.
Recorder: Marvin Hill, Southern Illinois University.
- 5:00 p.m. Adjournment

Thursday, March 27

- 9:00 a.m. New and Emerging Technologies
Chairman: Carlo A. Simeoli, Florissant Valley Community College.
- A. Topic I - Health Technologies - Dr. Oliver H. Duggins, Chairman, Life Sciences Division, Forest Park Community College, St. Louis, Missouri.

9:30 a.m. B. Topic II - Law Enforcement (Police Science) - W. E. Bauer,
Law Enforcement Training Consultant, Ohio Department of
Education.

10:15 a.m. Break

10:20 a.m. C. Topic III - Aviation Technology - Lawrence M. Bott, Chief of
Education Training Methods and Technique Analysis, F.A.A.

12:00 noon Lunch

1:00 p.m. Buses Leave for McDonnell-Douglas Corporation

1:30 p.m. Tour McDonnell-Douglas Corporation (Space Center)

3:30 p.m. Break

3:45 p.m. Conferee-Technician Discussion Groups (6) - Exploring the
Realities of Technician Employment in Industry.

5:15 p.m. Buses Leave for Hotel

7:00 p.m. Banquet
Speaker: Raymond J. Stith, President, Florissant Valley
Community College.

Friday, March 28

8:30 a.m. Summary Reports of Clinic Discussions Sessions.
Chairman: Mary Ellis, Technical Education Research Center.

A. Topic I - Research - Robert Gray

8:50 a.m. B. Topic II - Residential Facilities - Arnold H. Potthast

9:10 a.m. C. Topic III - Cooperative Programs - Carl S. Barber

9:30 a.m. D. Topic IV - Curriculum Development - Maurice W. Roney

10:00 a.m. Break

10:15 a.m. Closing Session: Presiding - Walter J. Brooking.
Speaker: The Impact of New Legislation on Technical Educa-
tion - Dr. Leon P. Minear, Director, Division of Vocational
and Technical Education, U.S.O.E.

11:00 a.m. Closing Remarks - Jerry S. Dobrovolsky, Conference Chairman

11:30 a.m. Adjournment

APPENDIX B

NATIONAL CLINIC ON TECHNICAL EDUCATION

St. Louis, Missouri
March 26-28, 1969

CONFEREES

Adams, Jon P., Dean, Schoolcraft College, 17600 Haggerty, Livonia, Michigan 48154.

Anderson, Richard T., Supervisor of Curriculum, Waukesha Vocational, Technical, and Adult School, 222 Maple Avenue, Waukesha, Wisconsin 53186.

Anderson, Robert K., State Supervisor, Technical Education, Minnesota Department of Education, Centennial Building, 659 Cedar Street, St. Paul, Minnesota 55101.

Andreasen, Richard C., Kalamazoo Valley Community College, 1924 Whites Road, Kalamazoo, Michigan 49001.

Andrews, John E., Supervisor, Missouri State Department of Education, Jefferson City, Missouri 65101.

Ankeney, John V., Virginia Commonwealth University, Richmond, Virginia 23220.

Anthony, Clarence R., Supervisor, Technical Education, State Department of Education, State Capitol Building, Helena, Montana 59601.

Arnold, Joseph P., Ohio State University, 980 Kinnear Road, Columbus, Ohio 43221.

Ballard, J. Barry, Northern Oklahoma College, Tonkawa, Oklahoma 74653.

Baker, John B., Electronic Instructor, Jefferson College, Hillsboro, Missouri 63050.

Barber, Carl S., Program Officer, Vocational-Technical Education, U. S. Office of Education, 601 East 12th Street, Kansas City, Missouri 64106.

Barlow, Melvin L., Director, Division of Vocational Education, University of California, 131 Moore Hall, Los Angeles, California 90024.

Bartel, Carl R., Division of Industrial Design and Technology, Arizona State University, Tempe, Arizona 85281.

Bauer, W. E., Law Enforcement Training Consultant, Ohio State Department of Education, Columbus, Ohio 43210.

Beasley, Arthur, Jones County Junior College, Ellisville, Mississippi 39437.

Bennett, C. Eugene, Director, Miami University, Middletown Campus, Middletown, Ohio 45040.

Benson, Roland A., Consultant, Post Secondary Program Development, Texas Education Agency, Capitol Station, 201 East 11th Street, Austin, Texas 78711.

Biehler, Fred, Department of Industrial Education, Oklahoma State University, Stillwater, Oklahoma 74074.

Bilmond, Charles W., Instructor, Virginia Commonwealth University, Richmond, Virginia 23220.

Boss, Henry T., Assoc. Professor, Southern Illinois University, Education Division, Edwardsville, Illinois 62025.

Bott, Lawrence M., Chief of Education Training Methods and Technique Analysis, Federal Aviation Agency, Washington, D. C. 20590.

Bowers, George, Dean, School of Applied Science, Miami University, 304 Gaskill Hall, Oxford, Ohio 45056.

Boyers, Ralph, Williamsport Area Community College, Williamsport, Pennsylvania 17701.

Breland, Boyce L., Assistant Director, Vocational-Technical Education, Mississippi Gulf Coast Junior College District, Pekin, Mississippi 39573.

Bressler, James P., Dean, Applied Arts and Sciences, Williamsport Area Community College, 1005 West Third Street, Williamsport, Pennsylvania 17701.

Briscoe, John C., Assistant Director, Science and Technology, New York State Department of Education, 800 North Pearl Street, Albany, New York 12204.

Brooking, Walter J., Program Specialist, Technical Education, Division of Vocational and Technical Education, U. S. Office of Education, Washington, D. C. 20202.

Brown, D. W., Department of Industrial Education, Oklahoma State University, Stillwater, Oklahoma 74074.

Bryson, James W., Teacher-Trainer, Trade and Industrial Education, University of Georgia, Athens, Georgia 30601.

Buell, L. Wood, Director, West Virginia Technical College, Montgomery, West Virginia 25136.

Buffo, Tony, Cowley County Community Junior College, Arkansas City, Kansas 67005.

Busch, Adrian Vanden, Muskegon Community College, Muskegon, Michigan 49443.

Buterbaugh, John M., Editor, Engineering and Technology, Charles E. Merrill Publishing Company, 1300 Alum Creek Drive, Columbus, Ohio 43210.

Caldwell, Ralph M., State Supervisor, Technical Education, Box 771, Jackson, Mississippi 39205.

Capaldi, Lewis, Williamsport Area Community College, Williamsport, Pennsylvania 17701.

Carlson, Arthur P., Faculty Counselor, Milwaukee Technical College, 1015 North 6th Street, Milwaukee, Wisconsin 53703.

Carter, M. P., Director, Vocational and Technical Education, Jones County Junior College, P.O. Box 97, Ellisville, Mississippi 39437.

Carter, William C., Director of Student Affairs, Kansas Technical Institute, Salina, Kansas 67401.

Christiansen, Norman, Clare County School District, Clare, Michigan 48617.

Cobb, William Smith, Director of Training, Mississippi Agricultural and Industrial Board, State Office Building, Jackson, Mississippi 39205.

Collum, J. C., Lee College, Baytown, Texas 77520.

Cossand, Joseph P., President, Junior College District of St. Louis, 7508 Forsyth, St. Louis, Missouri 63105.

Cox, John, Mineral Area College, 322 West Main Street, Flat River, Missouri 63601.

Cox, Thomas N., Director, Columbiana County Branch, Kent State University, 250 Franklin Avenue, Salem, Ohio 44460.

Creech, Thomas, Director of Academic Affairs, Schilling Institute, Salina, Kansas 67401.

Crowley, Robert A., Coordinator, Hawkeye Institute of Technology, 224 Commercial Street, Waterloo, Iowa 50701.

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